Technical Report 1367

Tier One Performance Screen Initial Operational Test and Evaluation: 2015-2016 Biennial Report

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U.S. Army Research Institute for the Behavioral and Social Sciences

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14. ABSTRACT *(Maximum 200 words)*:

In addition to educational, physical, and moral screens, the U.S. Army relies on the Armed Forces Qualification Test (AFQT), a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), to select new Soldiers into the Army. Although the AFQT is useful for selecting new Soldiers, other personal attributes are important to Soldier performance and retention. Based on previous U.S. Army Research Institute (ARI) investigations, the Army selected one promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), for an initial operational test and evaluation (IOT&E), beginning administration to applicants in 2009. Criterion data are being compiled at 6-month intervals from administrative records, schools for selected military occupational specialties (MOS), and Soldiers in units. This is the 14th in a series of evaluations of the TAPAS. Similar to prior research, the cumulative results thus far suggest that several TAPAS scales significantly predict a number of criteria of interest, indicating that the measure holds promise for both selection and classification purposes.

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TIER ONE PERFORMANCE SCREEN INITIAL OPERATIONAL TEST AND EVALUATION: 2015-2016 BIENNIAL REPORT

EXECUTIVE SUMMARY

Research Requirement:

In addition to educational, physical, and moral screens, the U.S. Army relies on the Armed Forces Qualification Test (AFQT), a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), to select new Soldiers into the Army. Although the AFQT has proven to be and will continue to serve as a useful metric for selecting new Soldiers, there is a growing recognition of the need to consider whole person assessment that takes other personal attributes, in particular non-cognitive attributes (e.g., temperament, interests, and values) into consideration. Non-cognitive attributes are important to entry-level Soldier performance and retention (e.g., Campbell & Knapp, 2001; Ingerick, Diaz, & Putka, 2009; Knapp & Heffner, 2009, 2010; Knapp & Tremble, 2007). Based on previous research (Knapp & Heffner, 2010), the Army selected one particularly promising measure, the Tailored Adaptive Personality Assessment System (TAPAS), as the basis for an initial operational test and evaluation (IOT&E) of the *Tier One Performance Screen (TOPS)*. The TAPAS capitalizes on the latest advances in testing technology to assess motivation through the measurement of personality characteristics.

Procedure:

In May 2009, the Military Entrance Processing Command (MEPCOM) began administering the TAPAS on the computer adaptive platform for the ASVAB (CAT-ASVAB) at Military Entrance Processing Stations (MEPS). To evaluate the TAPAS, outcome (criterion) data are being collected at multiple points in time from Soldiers who took the TAPAS at entry. Specifically, initial military training (IMT) criterion data are now being collected at schools for Soldiers in 18 (a substantial increase over the original eight) military occupational specialties (MOS). Project teams also are collecting criterion data from Soldiers (regardless of MOS) in their units in multiple waves of site visits during the course of the IOT&E.

The criterion measures include job knowledge tests, an attitudinal assessment (the Army Life Questionnaire), and performance rating scales completed by the Soldiers' cadre members (in IMT) or supervisors (in units). Completion rates and attrition status are obtained from administrative records for all Soldiers. Another variable of interest, Advanced Individual Training (AIT) course grades, is recorded, but those administrative records are not currently accessible to TOPS researchers.

The data presented in this report come from TAPAS data collected through the fall of 2016 and criterion data collected through December 2016. It consists of a total of 915,578 applicants who took the TAPAS; 846,400 of these individuals were in the TOPS Applicant Sample. The Applicant Sample (used for analysis purposes) excluded prior service applicants and those individuals ineligible for service based on education requirements or extremely low AFQT scores. The validation sample sizes were considerably smaller, with the IMT Validation Sample comprising 43,647 Soldiers, the In-Unit Validation Sample comprising 7,228 Soldiers, and the

Administrative Validation Sample (which includes Soldiers with criterion data [e.g., attrition] from at least one administrative source) comprising 480,138 Soldiers.

Data from the job knowledge tests, performance ratings provided by cadre or supervisor, attitudinal assessment, and administrative sources were combined to yield an array of scores representing important Soldier outcomes. In general, the criterion scores exhibited acceptable and theoretically consistent psychometric properties. The exception to this was the IMT performance-rating scales, which exhibit low inter-rater reliability. Although we are unable to compute reliability estimates for the in-unit ratings, since there is only one supervisor rater per Soldier, it is possible that they are relatively unstable as well. At a minimum, however, results involving the IMT rating scales may underestimate relationships with other variables.

Our approach to analyzing the TAPAS' incremental predictive validity was consistent with previous evaluations of this measure and similar experimental non-cognitive predictors (e.g., Ingerick et al., 2009; Knapp & Heffner, 2009, 2010, 2011). In brief, this approach involved testing a series of hierarchical regression models, regressing scores for each criterion measure onto Soldiers' AFQT scores, followed by their TAPAS composite or TAPAS scale scores in the second step. The resulting increment in the multiple correlation value (ΔR) when the TAPAS composite or TAPAS scale scores were added to the baseline regression models served as our index of incremental validity. Correlations between TAPAS scale scores and selected criteria were also examined. Analyses used the TAPAS Will-Do, Can-Do, and Adaptation composite scores.

To further examine the relationships between the TAPAS and the various IMT, in-unit, and attrition criteria, we conducted analyses that assessed implementation of the TAPAS with respect to AFQT categories and TAPAS score percentiles. For some of these analyses, AFQT Category IIIB/IV Soldiers were classified into two groups – those scoring below the 10th percentile on TAPAS and those scoring above the 10th percentile.

Findings:

Consistent with previous TOPS IOT&E reports, the results of this evaluation suggest TAPAS holds promise for new Soldier selection. Results of the incremental validity analyses indicate that the TAPAS predicts important first-term criteria over and above the AFQT, especially measures tapping motivational aspects of Soldier performance, such as physical fitness, adjustment to Army life, commitment and fit, and discipline. Further, examination of AFQT categories and quintile splits of predictor composites showed a clear linear improvement in favor of higher scoring individuals. Individuals in the lowest AFQT categories performed the worst.

The Will-Do composite, a combination of TAPAS scales that predict motivation-based outcomes, was associated with the greatest incremental validity gains compared to other TAPAS composites. This was especially true for the prediction of Performance Rating Scales (PRS): Physical Fitness and Bearing, Will Do Performance, and Army Life Adjustment from the ALQ. When examining outcomes by AFQT category, a clear distinction was seen when comparing the IIIB and IV Soldiers who scored above and below the 10th percentile on TAPAS. One particularly large difference was for disciplinary incidents where the low scoring groups had approximately 5%

and 8% more disciplinary incidents, respectively, compared to the higher scoring IIIB and IV groups. The higher scoring Category IIIB and IV groups had lower attrition rates (ranging from a difference of 1.2% to 5.6%) than the low scoring groups at 6, 12, and 24 months' time in service. The Adaptation composite generally provided small incremental validity gains for predicting attrition, showing relatively larger gains for predicting attrition later in the enlistment term. Even these small gains in validity are important, particularly given the modest relationship with the AFQT.

Utilization and Dissemination of Findings:

The research findings will be used by the Army Deputy Chief of Staff, G-1; U.S. Army Recruiting Command; Assistant Secretary of the Army (Manpower and Reserve Affairs); and Training and Doctrine Command to evaluate the effectiveness of tools used for Army applicant selection and assignment. With each successive set of findings, the TAPAS can be revised and refined to meet Army needs and requirements.

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CHAPTER 1: INTRODUCTION

Cristina D. Kirkendall (ARI), Deirdre J. Knapp (HumRRO), Tonia S. Heffner, and Leonard A. White (ARI)

Background

The Selection and Asignment Research Unit (SARU) of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is responsible for conducting personnel research for the Army. The focus of SARU's research is maximizing the potential of the individual Soldier through effective selection, classification, and retention strategies.

In addition to educational, physical, and moral screens, the U.S. Army relies on the Armed Forces Qualification Test (AFQT), a composite score from the Armed Services Vocational Aptitude Battery (ASVAB), to select new Soldiers into the Army. Although the AFQT has proven to be, and will continue to serve as a useful metric for selecting new Soldiers, other personal attributes, in particular non-cognitive attributes (e.g., temperament, interests, and values), are important to entry-level Soldier performance and retention (e.g., Knapp & Tremble, 2007).

In December 2006, the Department of Defense (DoD) ASVAB review panel—a panel of experts in the measurement of human characteristics and performance— released their recommendations (Drasgow, Embretson, Kyllonen, & Schmitt, 2006), several of which focused on supplementing the ASVAB with additional measures for use in selection and classification decisions. The ASVAB review panel further recommended that the use of these measures be validated against performance criteria.

Just prior to the release of the ASVAB review panel's findings, ARI had initiated a longitudinal research effort, *Validating Future Force Performance Measures (Army Class)*, to examine the prediction potential of several non-cognitive measures (e.g., temperament and person-environment fit) for Army outcomes (e.g., performance, attitudes, attrition). The Army Class research project was a six-year effort conducted with contract support from the Human Resources Research Organization ([HumRRO]; Allen, Knapp, & Owens, 2013; Ingerick, Diaz, & Putka, 2009; Knapp & Heffner, 2009). Experimental predictors were administered to new Soldiers in 2007 and early 2008. Army Class collected school-based criterion data on a subset of the Soldier sample as they completed job training. Job performance criterion data were collected from Soldiers in the Army Class longitudinal validation sample in 2009 with a second round of data collections in Soldiers' units completed in April 2011 (Knapp, Owens, & Allen, 2012). Final analysis and reporting of this program of research is complete (Allen et al., 2013).

After the Army Class research began, ARI initiated the *Expanded Enlistment Eligibility Metrics (EEEM)* project (Knapp & Heffner, 2010). The EEEM goals were similar to Army Class, but the focus was specifically on Soldier selection and the time horizon was much shorter. Specifically, EEEM required identification of one or more promising new predictor measures for immediate

implementation. The EEEM project capitalized on the existing Army Class data collection procedure and, thus, the EEEM sample was a subset of the Army Class sample.

Based on the EEEM findings, Army policy-makers approved an initial operational test and evaluation (IOT&E) of the *Tier One Performance Screen (TOPS)*. This report is the latest in a series presenting continuing analyses from the IOT&E of TOPS.

The Tier One Performance Screen (TOPS)

Six experimental pre-enlistment measures were included in the EEEM research (Allen, Cheng, Putka, Hunter, & White, 2010). These included several temperament measures, a situational judgment test, and two person-environment fit measures based on values and interests. The most promising measures recommended to the Army for implementation were identified based on the following considerations:

- Incremental validity over AFQT for predicting important performance and retention-related outcomes,
- Minimal subgroup differences,
- Low susceptibility to response distortion (e.g., faking optimal responses), and
- Minimal administration time requirements.

The Tailored Adaptive Personality Assessment System ([TAPAS]; Stark, Chernyshenko, & Drasgow, 2010) surfaced as the top choice[1]. The TAPAS is a measure of personality characteristics (e.g., achievement, sociability) that capitalizes on the latest advances in psychometric theory and provides a good indicator of personal motivation.

In May 2009, the Military Entrance Processing Command (MEPCOM) began administering the TAPAS on the computer adaptive platform for the ASVAB (CAT-ASVAB). Initially, the TAPAS was to be administered only to Education Tier 1, non-prior service applicants.[2] This limitation to Education Tier 1 was removed early in CY2011 so the Army could evaluate the TAPAS across all types of applicants.

TOPS uses non-cognitive measures to identify applicants who would likely perform differently (higher or lower) than would be predicted by their ASVAB scores. The initial conceptualization for the IOT&E was to use the TAPAS as a tool for "screening in" Education Tier 1 applicants with lower AFQT scores, allowing more Soldiers to come into the Army with lower AFQT than they otherwise would have. However, changing economic conditions spurred a reconceptualization that led to using the TAPAS as a tool to screen out low motivated applicants, thus making the selection criteria to enter the Army more stringent. Decision rules regarding the derivation and use of TAPAS composite scores could be adjusted in myriad ways to reflect evolving market conditions.

[1] Other promising assessments include the Work Preferences Assessment ([WPA]; Putka & Van Iddekinge, 2007) and the Information/Communications Technology Literacy test ([ICTL]: Russell & Sellman, 2009).
[2] Applicant educational credentials are classified as Tier 1 (primarily high school diploma), Tier 2 (primarily non-diploma graduate), and Tier 3 (not a high school graduate).

In terms of actual practice, as part of the TOPS IOT&E TAPAS scores were originally used to screen out a small number of AFQT Category IIIB/IV applicants.[3] In 2014, Tier 2 applicants who scored below the 30th percentile on TAPAS were also screened out. In 2015, the IOT&E was modified to allow all Tier 1 Category IIIB applicants to enlist regardless of TAPAS score. Most recently (at the beginning of 2017), use of TAPAS for limited operational applicant screening was temporarily suspended, though TAPAS continues to be administered to most Army applicants.

Evaluating TOPS

To evaluate the TAPAS, the Army is collecting training criterion data on Soldiers in multiple military occupational specialties (MOS) as they complete initial military training (IMT). This originally involved a target group of eight MOS which comprised large, highly critical MOS as well as MOS to represent the diversity of job requirements across the Army.[4] Over time, however, additional MOS have been added. The criterion measures include job knowledge tests (JKTs); an attitudinal assessment, the Army Life Questionnaire (ALQ); and performance rating scales (PRS). These measures are computer-administered at the schools (IMT) for each of the 12 target MOS examined in the present report. The process is overseen by Army personnel with guidance and support from both ARI and HumRRO. Course grades and completion rates are obtained from administrative records for all Soldiers who take the TAPAS, regardless of MOS.

Criterion data are also being collected from Soldiers and their supervisors during data collection trips to major Army installations. These proctored "in-unit" data collections began in January 2011 and target all Soldiers who took the TAPAS prior to enlistment. The in-unit criterion measures include JKTs, the ALQ, and PRS. Separation status of all Soldiers who took the TAPAS prior to enlistment is tracked throughout the course of the research.

This report describes the fourteenth iteration of the criterion-related validation through the TOPS IOT&E initiative. Prior evaluations are described in a series of technical reports (Bynum & Mullins, 2017; Knapp & Heffner, 2011, 2012; Knapp, Heffner, & White, 2011; Knapp & LaPort, 2013a, 2013b, 2014) and internal memoranda. Additional validation analyses will be prepared and conducted at six-month intervals throughout the multi-year IOT&E period.

Overview of Report

Chapter 2 explains how the evaluation analysis data files are constructed and then describes characteristics of the current sample. Chapter 3 describes the TAPAS, including content, scoring, and psychometric characteristics. Chapter 4 describes the IMT and in-unit criterion scores used in this evaluation, including their psychometric characteristics. Criterion-related validation analyses for the TAPAS are presented in Chapter 5. The report concludes with Chapter 6, which summarizes our continuing efforts to evaluate TOPS and looks toward plans for future iterations of these evaluations.

[3] Examinees are classified into categories based on their AFQT percentile scores (Category I = 93-99, Category II = 65-92, Category IIIA = 50-64, Category IIIB = 31-49, Category IV = 10-30, Category V = 1-9).

[4] The original eight MOS were Infantryman (11B), Armor Crewman (19K), Military Police (31B), Human Resources Specialist (42A), Health Care Specialist (68W), Motor Transport Operator (88M), and Light Wheel Vehicle Mechanic (91B).

CHAPTER 2: SAMPLE CHARACTERISTICS

Erin S. Banjanovic, D. Matthew Trippe, and Justin Purl (HumRRO)

This chapter describes characteristics of the samples used in the TOPS IOT&E evaluation analyses. We begin with a summary of data sources, describe how Soldier data were filtered for analysis, and then describe multiple subsamples that were created to support various types of analyses.

Data Sources

An illustrative view of the TOPS sources of predictor and criteria data is provided in Figure 2.1. The lighter boxes within the figure represent sources of data, and the darker boxes represent samples on which descriptive or inferential analyses are conducted. The leftmost column in the figure summarizes the predictor data sources used to derive the TOPS Applicant Sample. The other columns summarize the research-only (i.e., non-administrative) and administrative criterion data. Predictor and criterion data are merged to form the IMT, In-Unit and Administrative Validation Samples.

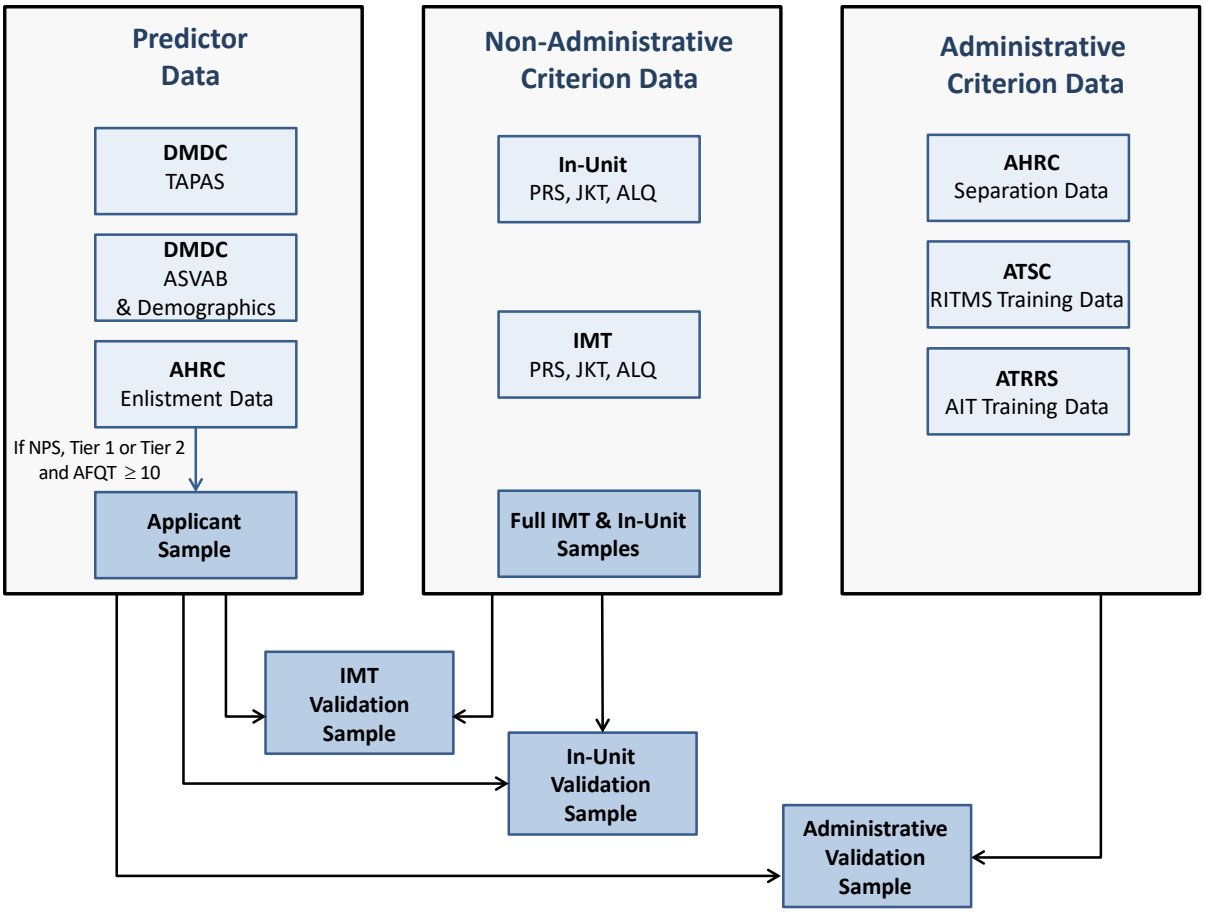

Figure 2.1. Overview of TOPS data file merging and nested sample generation process.

Sample Filters

For the purpose of evaluating the effectiveness of TAPAS, exclusions to the analysis samples were imposed based on AFQT score, education level, service history, and component.

AFQT Category

The ASVAB is a multiple aptitude battery of tests administered by the MEPCOM. Most military applicants take the computer adaptive version of ASVAB (i.e., the CAT-ASVAB). Scores on the ASVAB tests are combined to create composite scores for use in selecting applicants into the Army and classifying them into an MOS. The AFQT, the composite used for selecting applicants into the Army, comprises the Verbal Expression[5] (VE), Arithmetic Reasoning (AR), and Math Knowledge (MK) tests (AFQT = 2*VE + AR + MK). Applicants must meet a minimum AFQT score to be eligible to serve in the military, and the Services favor high-scoring applicants for enlistment. AFQT percentile scores are divided into the following categories:[6]

- Category I (93-99)
- Category II (65-92)
- Category IIIA (50-64)
- Category IIIB (31-49)
- Category IV (10-30)
- Category V (1-9)

AFQT Category V Soldiers are not eligible for enlistment. Category IV accessions are greatly restricted, some restriction is placed on accessing Category IIIB accessions, and priority is given to Category I-IIIA accessions. The Applicant Sample excludes Soldiers with an AFQT score of less than 10 (i.e., Category V; n = 17,948).

For classification, scores on the ASVAB tests are combined to form 10 Aptitude Area (AA) composites. An applicant must receive a minimum score on the MOS-relevant AA composite(s) to qualify for classification to that MOS. For example, applicants must score a 95 in both the Electronics (EL) and Signal Communications (SC) AA composites to qualify as a Signal Support Specialist (25U). Descriptive statistics for the AFQT, ASVAB tests, and AA composites are reported in Appendix A. AFQT category frequencies are reported in Tables 2.1 and 2.2.

Education Tier

In the early 1980s, the Department of Defense initiated a detailed study of the relationship between educational credentials, other background characteristics, and adaptability for military service. The results supported a three-tier classification of educational credentials including:

[5] Verbal Expression is a scaled combination of the Word Knowledge (WK) and Paragraph Comprehension (PC) tests.
[6] For more information on ASVAB scoring, see the official website of the ASVAB, www.officialasvab.com.

Tier 1 – Primarily high school diploma and higher (e.g., individuals currently in high school or college, college graduates, adult/alternative diplomats, home school diplomats)[7]

Tier 2 – Primarily non-diploma graduate (e.g., GED certificants, vocational-technical certificants, non-traditional high school credential holders)

Tier 3 – Non-high school graduate (i.e., individuals not currently attending high school and do not possess a high school diploma or alternate credential)

Consistent with Army policy, which specifies that Soldiers classified as Tier 3 are ineligible for accession, the Applicant Sample excludes Tier 3 Soldiers and those with unknown values (*n* = 12,886). Subsequent analyses report results separately for Tier 1 and Tier 2 Soldiers.

Service History

Because the TOPS program is designed to predict first term Soldier performance, individuals with prior service history are excluded from the analysis samples (*n* = 15,278).

Service Component

The Applicant Sample includes Soldiers from all Army components – Regular Army (RA), U.S. Army Reserve (USAR), and U.S. Army National Guard (ARNG). For most analyses, Soldiers from all components are included. However, for analyses involving separation data, results are only presented for the Regular Army Soldiers.

MOS

Because the TAPAS is not used in the selection of Interpreters and Translators, 09L and 09C are excluded from the analysis samples (*n* = 1,329).

Description of Analysis Samples

Table 2.1 summarizes the full TAPAS sample by the key variables that were used to create the analysis samples. Among the 915,578 applicants in the total unfiltered sample, 846,400 (92.4%) met the criteria for the Applicant Sample (i.e., non-prior service, Education Tier 1 or 2, and minimum AFQT score of 10). A detailed breakout of background and demographic characteristics observed in the analysis samples appears in Table 2.2.

[7] In 2012, the Department of Defense announced that applicants who score 50 or higher on the AFQT and possess diplomas from home schools, virtual/distance learning, and adult/alternative schools will receive Tier 1 enlistment priority.

Table 2.1. Full TAPAS Sample Characteristics

Variables	*n*	% of Total Sample (*N* = 915,578)
Education Tier		
Tier 1	857,648	93.7
Tier 2	45,044	4.9
Tier 3	7,183	0.8
Unknown	5,703	0.6
Prior Service		
Yes	15,278	1.7
No	900,300	98.3
Military Occupational Specialty		
Infantry (11B/C/X + 18X)	83,823	9.2
Combat Engineer (12B)	14,077	1.5
Cannon Crewmember (13B)	9,970	1.1
Field Artillery Tactical Data Systems Specialist (13D)	4,136	0.5
Fire Support Specialist (13F)	5,679	0.6
Cavalry Scout (19D)	12,961	1.4
Armor (19K)	5,792	0.6
Military Police (31B)	22,808	2.5
Human Resources Specialist (42A)	14,446	1.6
Health Care Specialist (68W)	25,046	2.7
Motor Transport Operator Soldiers (88M)	26,739	2.9
Light Wheel Vehicle Mechanic (91B)	27,519	3.0
Other	291,875	31.9
Unknown [a]	370,707	40.5
AFQT Category [b]		
I	50,172	5.5
II	245,479	26.8
IIIA	174,889	19.1
IIIB	288,535	31.5
IV	136,443	14.9
V	17,948	2.0
Unknown [a]	2,112	0.2
Contract Status		
Signed	590,643	64.5
Not signed	324,935	35.5
Applicant Sample [c]	846,400	92.4

[a] Generally, when the MOS or AFQT category is unknown, it is either because the information was not yet available in the data sources on which the December 2014 data file was based or because the respondent did not access into the Army.

[b] AFQT Categories IIIB and IV are oversampled. Values presented are not representative of Army accessions.

[c] The Applicant Sample size is smaller than the total TAPAS sample because it is limited to non-prior service, Education Tier 1 and 2, and AFQT ≥ 10 applicants.

Table 2.2. Background and Demographic Characteristics of the TOPS Samples

Characteristic	Applicant [a] *n* = 846,400		Administrative Validation [b] *n* = 480,138		IMT Validation [c] *n* = 43,647		In-Unit Validation [d] *n* = 7,228	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Component								
Regular	475,933	56.2	272,171	56.7	26,050	59.7	7,200	99.6
ARNG	261,064	30.8	148,503	30.9	13,712	31.4	21[e]	0.3
USAR	109,403	12.9	59,464	12.4	3,885	8.9	7[e]	0.1
Education Tier								
Tier 1	803,727	95.0	461,747	96.2	42,109	96.5	7,016	97.1
Tier 2	42,673	5.0	18,391	3.8	1,538	3.5	212	2.9
Military Occupational Specialty								
11B/C/X + 18X	79,159	9.4	74,918	15.6	14,526	33.3	1,800	24.9
12B	13,501	1.6	12,403	2.6	2,607	6.0	277	3.8
13B	9,529	1.1	9,024	1.9	121	0.3	186	2.6
13D	3,942	0.5	3,781	0.8	431	1.0	89	1.2
13F	5,405	0.6	5,072	1.1	785	1.8	87	1.2
19D	12,308	1.5	11,742	2.4	911	2.1	361	5.0
19K	5,590	0.7	5,325	1.1	1,581	3.6	164	2.3
31B	21,595	2.6	19,934	4.2	6,443	14.8	156	2.2
42A	13,668	1.6	12,861	2.7	1,685	3.9	186	2.6
68W	23,906	2.8	22,117	4.6	4,344	10.0	312	4.3
88M	25,491	3.0	23,313	4.9	6,077	13.9	389	5.4
91B	26,312	3.1	24,057	5.0	990	2.3	359	5.0
Other	275,553	32.6	255,492	53.2	3,146	7.2	2,862	39.6
Unknown	330,441	39.0	99	0.0	--	--	--	--
AFQT Category[f]								
I	46,117	5.4	28,165	5.9	2,452	5.6	335	4.6
II	230,198	27.2	144,959	30.2	14,106	32.3	1,909	26.4
IIIA	165,233	19.5	102,022	21.2	9,127	20.9	1,569	21.7
IIIB	275,024	32.5	176,049	36.7	15,343	35.2	2,982	41.3
IV	129,828	15.3	28,943	6.0	2,619	6.0	433	6.0
Gender								
Female	182,231	21.5	87,208	18.2	5,320	12.2	877	12.1
Male	640,051	75.6	373,694	77.8	37,181	85.2	6,072	84
Missing	24,118	2.8	19,236	4.0	1,146	2.6	279	3.9
Race								
African American	200,688	23.7	104,748	21.8	6,932	15.9	1,668	23.1
American Indian	6,774	0.8	3,772	0.8	352	0.8	49	0.7
Asian	41,296	4.9	21,357	4.4	1,488	3.4	400	5.5
Hawaiian/Pacific	2,243	0.3	1,265	0.3	143	0.3	24	0.3
Caucasian	578,454	68.3	341,992	71.2	33,780	77.4	4,947	68.4
Multiple	2,966	0.4	1,870	0.4	163	0.4	33	0.5
Declined to Answer/Missing	13,979	1.7	5,134	1.1	789	1.8	107	1.5

Table 2.2. (Continued)

Characteristic	Applicant [a] *n* = 846,400		Administrative Validation [b] *n* = 480,138		IMT Validation [c] *n* = 43,647		In-Unit Validation [d] *n* = 7,228	
	n	*%*	*n*	*%*	*n*	*%*	*n*	*%*
Ethnicity								
Hispanic/Latino	134,200	15.9	73,773	15.4	6,758	15.5	1,200	16.6
Not Hispanic	698,731	82.6	401,954	83.7	36,232	83.0	5,934	82.1
Declined to Answer/Missing	13,469	1.6	4,411	0.9	657	1.5	94	1.3

[a] Limited to applicants who had no prior service, Education Tier 1 or 2, AFQT ≥ 10; served as the core analysis sample. Additionally, 09L and 09C Soldiers were removed from all analyses.
[b] Soldiers in Applicant Sample with at least one criterion record (i.e., schoolhouse, in-unit, ATRRS, RITMS, or attrition).
[c] Soldiers in Applicant Sample with criterion data collected at schoolhouses.
[d] Soldiers in Applicant Sample with criterion data collected in units.
[e] We believe these Soldiers were on active duty when the in-unit data collections were taking place.
[f] AFQT Categories IIIB and IV are oversampled. Values presented are not representative of Army accessions.

Across all analysis samples, a majority of the Soldiers are Regular Army, Education Tier 1. Of the targeted MOS, the 11B series predominates, with more than three times as many Soldiers as the next largest group (i.e., 88M). The least represented MOS include 91A, 91P, 13P and 13R Soldiers.

The Administrative Validation Sample includes 480,138 Soldiers who meet all of the inclusion criteria for the TOPS Applicant Sample and also have at least one record in an administrative criterion data source (e.g., Army Training Requirements and Resources System [ATRRS], Resident Individual Training Management System [RITMS]). There are 78,449 Soldiers with IMT criterion data; however, only 43,647 were linked to an administrative TAPAS record and included in the IMT Validation Sample. Similarly, there are 12,578 Soldiers with in-unit data but only 7,228 of these Soldiers have matching TAPAS data and were included in the In-Unit Validation Sample. There are 880 Soldiers with a TAPAS record and both IMT and in-unit criterion data.

There are two primary reasons for the diminution of sample sizes between the Applicant Sample and the Administrative Validation samples. First, is the fact that many of the applicants did not access into the Army. Second, we rely on self-reported name and date of birth to match TAPAS records to the criterion data, which often results in unsuccessful matches. Further, fewer than half of the total number of Soldiers for whom we have IMT and in-unit criterion data are in the IMT and In-Unit Validation samples. In addition to cases lost due to unreliable reporting of the matching variables (name and date of birth), criterion testing started early in 2009 before TAPAS was being widely administered to applicants.

Sample sizes reported in all subsequent chapters and appendices are generally smaller than the figures reported here because of further data filtering or disaggregation that occurs for each particular analysis. For example, predictor and criterion scores were determined to be valid if they passed multiple data quality screens intended to identify unmotivated responding. Additional screens are analysis specific and have not yet been applied to the descriptive analysis of the samples described in this chapter. Further, a relatively small number of Soldiers in the Applicant Sample (n = 1,534) were administered an early version of the TAPAS and were excluded from analyses because of conceptual dissimilarities with subsequent TAPAS forms.

Summary

The TOPS analysis samples represent a combination of administrative, IMT, and in-unit data obtained from Soldiers, their supervisors and cadre, and archival sources at multiple points in time using a variety of data collection methods. The December 2016 full sample includes 915,578 applicants who took the TAPAS; however, some of them did not access into the Army or were ineligible for inclusion in the analyses based on their education status, AFQT score, component, or service history.

After excluding Education Tier 3, AFQT Category V, and prior service applicants from the full sample, the remaining 846,400 Soldiers were included in the TOPS Applicant Sample. This sample represents Soldiers who possess qualities that are most representative of applicants to the Army. A majority of the Soldiers included in the sample are listed as Regular Army, Education Tier 1; and are predominantly male, White and non-Hispanic.

Additional analysis samples were created based on this initial sample; however, they include fewer Soldiers. Of the full Applicant Sample, 480,138 (56.7%) had a record in at least one of the administrative criterion data sources; 43,647 (5.2%) had IMT data collected from the schoolhouse and 7,228 (.85%) had in-unit criterion data. The applicant sample and validation samples were used in subsequent analyses presented in Chapters 4 and 5, as well as their associated appendixes.

CHAPTER 3: THE TAILORED ADAPTIVE PERSONALITY ASSESSMENT SYSTEM (TAPAS)

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Description

The TAPAS is a personality measurement tool originally developed by Drasgow Consulting Group (DCG) under the Army's Small Business Innovation Research (SBIR) program. The system builds on the foundational work of the Assessment of Individual Motivation ([AIM]; White & Young, 1998) by incorporating features designed to promote resistance to faking and by measuring narrow personality constructs (i.e., facets) that are known to predict outcomes in work settings. The TAPAS uses methods from item response theory (IRT) to construct and score items. It can be administered in multiple formats: (a) as a fixed length, *non-adaptive test* where examinees respond to the same sequence of items or (b) as an *adaptive test* where each examinee responds to a unique sequence of items selected to maximize measurement accuracy for that specific examinee.

The TAPAS uses an IRT model for multidimensional pairwise preference (MDPP) items (Stark, Chernyshenko, & Drasgow, 2005) as the basis for constructing, administering, and scoring personality tests that are designed to reduce response distortion (i.e., faking) and yield normative scores even with tests of high dimensionality (Stark, Chernyshenko, & Drasgow 2012). TAPAS items consist of pairs of personality statements for which a respondent's task is to choose the one that is "more like me." The two statements constituting each item are matched in terms of social desirability and statement location (extremity), and often represent different personality facets. This approach makes it more difficult for examinees to determine which answers are better from the Army's perspective, and thus it is harder to "fake good" on all facets throughout the course of a test than it is with single-statement Likert-type personality items. Stark et al. (2014) reported small mean differences in scores of individuals who might be motivated to increase their scores (i.e., Army applicants who were told that their score might affect their enlistment eligibility) compared to individuals not so motivated (Air Force applicants who were asked to complete the TAPAS for research purposes only). In short, the TAPAS' features make it more difficult for respondents to distort their responses to obtain more desirable scores.

The use of an IRT model also greatly increases the flexibility of the assessment process. A variety of test versions can be constructed to measure personality facets that are relevant to specific work contexts, and the measures can be administered via paper-and-pencil or computerized formats. If test content specifications (i.e., test blueprints) are comparable across versions, the respective scores can be readily compared because the metric of the statement parameters has already been established by calibrating response data obtained from a base or reference group (e.g., Army recruits). The same principle applies to adaptive testing, wherein each examinee receives a different set of items chosen specifically to reduce the error in his or her facet scores at points throughout the exam. Adaptive item selection enhances test security because there is less overlap across examinees in terms of the items presented.

Another important feature of the TAPAS is that pools of statements representing over two dozen narrow personality facets are available. The initial TAPAS trait taxonomy was developed using the results of several large scale factor-analytic studies with the goal of identifying a comprehensive set of non-redundant narrow traits. Since then, additional facets have been added and these narrow traits, if necessary or desired, can be combined to form either the Big Five (the most common organization scheme for narrow personality traits) or any other number of broader traits (e.g., Integrity or Positive Core Self-Evaluations). This is advantageous for applied purposes because TAPAS versions can be created to fit a wide range of applications (both pre- and post-enlistment) and are not limited to a particular service branch or criterion. Selection of specific TAPAS facets can be guided by consulting the results of a meta-analytic study performed by DCG that mapped TAPAS facets to several important organizational criteria for military and civilian jobs (e.g., task proficiency, training performance, attrition) (Chernyshenko & Stark, 2007), as well as subsequent validation research. Table 3.1 presents the names of the TAPAS facets together with a description of a typical high scoring individual.

Scoring details and the criterion-related validation work that led to the inclusion of TAPAS in the TOPS IOT&E can be found in the *Expanded Enlistment Eligibility Metrics* report (Knapp & Heffner, 2010) and in earlier evaluation reports in this series (e.g., Knapp & Heffner, 2011).

Psychometric Properties of TAPAS Test Versions

As part of the TOPS IOT&E, nine versions of the TAPAS have been administered (see Table 3.2). The different versions have allowed ARI to explore the value of alternative facets and to retire the statement pools that were exposed in research settings. Currently, MEPS testing uses a statement pool developed solely for use by U.S. military services. All versions created in August 2011 or later use DoD-owned statement pools. In the present report, the validation analyses reported in Chapter 5 use all TAPAS versions except for the first one (13D-CAT) in which some of the dimensions are conceptually dissimilar from the same dimensions in later versions.

As a test security measure, form equivalence information is provided in a limited distribution addendum. Scores have been standardized within TAPAS versions to enable cross-version analyses.

Table 3.1. TAPAS Facets Names and Definitions

Facet Name	Brief Description
Achievement	High scoring individuals are seen as hard working, ambitious, confident, and resourceful.
Adjustment	High scoring individuals are well adjusted, worry free, and handle stress well.
Adventure Seeking	High scoring individuals enjoy participating in extreme sports and outdoor activities.
Aesthetics	High scoring individuals appreciate various forms of art and music and participate in art-related activities more than most people.
Attention Seeking	High scoring individuals tend to engage in behaviors that attract social attention. They are loud, loquacious, entertaining, and even boastful.
Commitment to Serve	High scoring individuals identify with the military and have a strong desire to serve their country.
Consideration	High scoring individuals are affectionate, compassionate, sensitive, and caring.
Cooperation	High scoring individuals are pleasant, trusting, cordial, non-critical, and easy to get along with.
Courage	High scoring individuals stand up to challenges and are not afraid to face dangerous situations.
Curiosity	High scoring individuals are inquisitive and perceptive; they are interested in learning new information and attend courses and workshops whenever they can.
Dominance	High scoring individuals are domineering, “take charge” and are often referred to by their peers as "natural leaders."
Even Tempered	High scoring individuals tend to be calm and stable. They don’t often exhibit anger, hostility, or aggression.
Ingenuity	High scoring individuals are inventive and can think "outside of the box."
Intellectual Efficiency	High scoring individuals believe they process information and make decisions quickly; they see themselves (and they may be perceived by others) as knowledgeable, astute, or intellectual.
Non-Delinquency	High scoring individuals tend to comply with rules, customs, norms, and expectations, and they tend not to challenge authority.
Optimism	High scoring individuals have a positive outlook on life and tend to experience joy and a sense of well-being.
Order	High scoring individuals tend to organize tasks and activities and desire to maintain neat and clean surroundings.
Physical Conditioning	High scoring individuals tend to engage in activities to maintain their physical fitness and are more likely participate in vigorous sports or exercise.
Responsibility	High scoring individuals are dependable, reliable, and make every effort to keep their promises.

Table 3.1. (Continued)

Facet Name	Brief Description
Self Control	High scoring individuals tend to be cautious, levelheaded, able to delay gratification, and patient.
Selflessness	High scoring individuals are generous with their time and resources.
Situational Awareness	High scoring individuals pay attention to their surroundings and rarely get lost or surprised.
Sociability	High scoring individuals tend to seek out and initiate social interactions.
Team Orientation	High scoring individuals prefer working in teams and make people work together better.
Tolerance	High scoring individuals are interested in other cultures and opinions that may differ from their own. They are willing to adapt to novel environments and situations.
Virtue	High scoring individuals strive to adhere to standards of honesty, morality, and "good Samaritan" behavior.

Descriptive statistics, subgroup score comparisons, and intercorrelations of individual TAPAS scale scores and composite scores are provided in Appendix A. Also reported there are correlations of TAPAS scales with AFQT, ASVAB subtests, and Aptitude Area composites. Because most of the observed correlations between TAPAS scales and ASVAB subtests were in the -.20 to +.20 range, the two measures are judged to provide non-redundant information about applicants' dispositions, which is advantageous in selection and classification contexts.

Table 3.2. TAPAS Versions by Administration Date

TAPAS Version	Dates Administered	# of Facets	Adaptive	# of Items
13D-CAT	May 4, 2009 to July 10, 2009	13	Yes	104
15D-Static	July 2010 to August 2011	15	No	120
15D-CAT v4	July 2010 to August 2011	15	Yes	120
15D-CAT v5	August 2011 to September 2013	15	Yes	120
15D-CAT v7	August 2011 to September 2013	15	Yes	120
15D-CAT v8	August 2011 to September 2013	15	Yes	120
13D-CAT v9	September 2013 – present	13	Yes	120
13D-CAT v10	September 2013 – present	13	Yes	120
13D-CAT v11	September 2013 – present	13	Yes	120

TAPAS Composites

An initial Education Tier 1 performance screen was developed from the TAPAS-95s scales for the purpose of testing in an applicant setting (Allen et al., 2010).[8] This was accomplished by (a) identifying key criteria of most interest to the Army, (b) sorting these criteria into "can do" and "will do" categories (see below), and (c) selecting composite scales corresponding to the can do and will do criteria, taking into account both theoretical rationale and empirical results. Two unit-weighted TAPAS composites were initially developed: (a) Can-Do (for predicting technical training performance and completion) and (b) Will-Do (for predicting attrition and motivation-based performance). These composites were used operationally from March 2011 – September 2013.

A subsequent set of composites was developed by DCG and includes three regression-weighted scores: (a) Can-Do, (b) Will-Do, and (c) Adaptation (for predicting attrition). These scores became available for Army decision-making in September 2013. More information about how the new composites were developed is provided in a limited distribution addendum. Those interested in obtaining a copy of this addendum should contact the editors for further information. The specific facet scales comprising each TAPAS composite is also close-hold information given the operational nature of this measure.

The criterion-related validation analyses in Chapter 5 use the new composite scores. Not all versions of the earlier TAPAS versions included the scales comprising the Can-Do and Adaptation composites. This is reflected in substantially smaller sample sizes for analyses involving the Can-Do composites. To maximize analysis sample sizes, scores on the Adaptation composite were computed using modified formulas for TAPAS versions 7 and 8. Scoring details and evidence of score equivalence across formulae is documented in a separately published ARI research note.

Summary

The purpose of this chapter was to describe the primary predictor measure being evaluated in the TOPS IOT&E. The TAPAS is unique among personality measures because it uses forced-choice pairwise items and IRT to promote resistance to faking. Promising initial validation research conducted as part of EEEM has been followed by additional research showing the validity of TAPAS in operational settings (Nye et al., 2012).

[8] TAPAS-95s was a paper-and-pencil, static version of the TAPAS used in the Army Class research.

CHAPTER 4: DESCRIPTION AND PSYCHOMETRIC PROPERTIES OF CRITERION MEASURES

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Criterion scores to validate the TAPAS were derived from measures administered for purposes of this research and from administrative records. The research measures included data provided by Soldiers in the form of job knowledge tests (JKTs) and a questionnaire measuring self-reported attitudes and experiences (Army Life Questionnaire [ALQ]). Additionally, research measures included data provided by Soldiers' cadre and supervisors through performance rating scales (PRS) created for research purposes. Criterion scores drawn from Soldiers' administrative records included separation status (i.e., attrition), IMT completion, and IMT grades. Table 4.1 provides a description of each of these measures.

Table 4.1. Summary of IMT and In-Unit Criterion Measures

Criterion Measure	Description
Soldier/ Cadre/ Supervisor Reported	
Job Knowledge Tests (JKT)	The Warrior Tasks and Battle Drills (WTBD) JKT measures knowledge that is general to all enlisted Soldiers. MOS-specific JKTs measure Soldiers' knowledge of basic facts, principles, and procedures required of Soldiers in training for a particular MOS. Each JKT includes a mix of item formats (e.g., multiple-choice, multiple-response, and rank order).
Army Life Questionnaire (ALQ)	The ALQ measures Soldiers' self-reported attitudes and experiences in the Army. The IMT and in-unit versions are very similar.
Performance Rating Scales (PRS)	The IMT PRS measure Soldiers' performance in two domains: (a) MOS-specific (e.g., learns preventive maintenance checks and services, learns to troubleshoot vehicle and equipment problems) and (b) Army-wide (e.g., exhibits effort, supports peers, demonstrates physical fitness). The IMT PRS are completed by training cadre. In-unit PRS cover Army-wide dimensions only and are completed by supervisors.
Administrative	
Attrition	Separation data are obtained on participating Soldiers beginning at 3-months and at regular 3-month intervals thereafter.
Initial Military Training (IMT) Criteria	These data provide information about whether Soldiers restarted IMT and for what reasons, the number of times Soldiers restarted training, graduation status, and final school grades for Soldiers in Advanced Individual Training (AIT) (when available).

In this chapter, we describe the criterion measures and composite scores, along with their distributional and psychometric properties. The descriptive statistics, as well as the correlations among the criteria and subgroup differences shown in Appendix B, are based on the Validation Sample (i.e., Education Tier 1 and 2, non-prior service, AFQT Category IV or above Soldiers with matching criterion data). Descriptive statistics and psychometric properties of the criterion measures for the full IMT and in-unit samples are reported in Appendix C.

Job Knowledge Tests (JKTs)

All participating Soldiers are given a general JKT called the Warrior Tasks and Battle Drills (WTBD). Additionally, some IMT Soldiers are given MOS-specific JKTs. Administration of MOS-specific JKTs to Soldiers in units was suspended in 2016 to reduce administration time. For purposes of the present evaluation, we have MOS-specific IMT JKT data for the following 12 MOS:

- Infantry (11B/C/X + 18X)
- Combat Engineer (12B)
- Cannon Crewmember (13B)
- Field Artillery Tactical Data Systems Specialist (13D)
- Fire Support Specialist (13F)
- Cavalry Scout (19D)
- Armor (19K)
- Military Police (31B)
- Human Resources Specialist (42A)
- Health Care Specialist (68W)
- Motor Transport Operator Soldiers (88M)
- Light Wheel Vehicle Mechanic (91B)

Seven of the MOS-specific JKTs were developed for this research project, and five others plus the WTBD JKT were developed through previous ARI research projects: Select21 (Collins, Le, & Schantz, 2005) or Army Class (Moriarty, Campbell, Heffner, & Knapp, 2009). Most of the JKT items are in a multiple-choice format with two to four response options. However, other formats, such as multiple-response (i.e., check all that apply), rank ordering, and matching are also used. Many items use visual images to make them more realistic and reduce reading requirements for the test.

We computed a single, overall raw score for each JKT by summing the total number of points Soldiers earned across the JKT items and computing a percent correct score based on the maximum number of points that could be obtained on each test. For the correlational analyses among criterion variables and criterion-related validity analyses, we converted the total raw scores to standardized scores (or *z*-scores) by standardizing the scores *within* each MOS. A JKT score was flagged and not included in analysis if the Soldier (a) omitted more than 10% of the assessment items, (b) took fewer than five minutes to complete the entire assessment, or (c) selected an implausible response to one of the careless responding items which were included on some of the JKTs (Knapp et al., 2012). Table 4.2 lists the reliability estimates for the WTBD and MOS-Specific JKTs.

Table 4.2. Job Knowledge Test (JKT) Reliability Estimates in the IMT and In-Unit Validation Samples

Domain/JKT	*n*	*α*
IMT		
MOS-Specific		
11B/C/X + 18X	10,703	.78
12B	534	.80
13D	302	.75
13F	515	.83
19D	696	.79
19K	1,322	.79
31B	5,121	.80
42A	1,174	.75
68W	3,652	.87
88M	4,236	.76
91B	720	.86
WTBD (Army-Wide) [a]	32,315	.67
In-Unit		
WTBD (Army-Wide) [a]	6,829	.57

Note. *α* = Coefficient Alpha. WTBD = Warrior Tasks and Battle Drills. Statistics for 13B are not reported because there are fewer than 100 cases.
[a] The WTBD JKTs are more heterogeneous in content than the MOS-specific JKTs, so would be expected to have lower alphas.

Table 4.3 lists the descriptive statistics for the IMT WTBD and MOS-specific JKTs by education tier. In-unit WTBD JKT scores averaged 62.24 for the Combined Tier 1 + Tier 2 (*n* = 6,829, *SD* = 10.69), 62.21 for Tier 1 alone (*n* = 6,630, *SD* = 10.70), and 63.19 for Tier 2 alone (*n* = 199, *SD* = 10.31).

Table 4.3. Job Knowledge Test (JKT) Descriptive Statistics in the IMT Validation Sample by Education Tier

Domain/JKT	*n*	*M*	*SD*	*Min*	*Max*	r_{WTBD}	r_{AFQT}
Tier 1 + 2 (Combined)							
MOS-Specific							
11B/C/X + 18X	10,703	59.53	10.89	23.33	86.67	.61	.43
12B	534	56.64	16.47	8.57	97.14	.59	.50
13D	302	54.20	16.06	8.82	85.29	.60	.41
13F	515	65.72	16.58	17.65	97.06	.55	.34
19D	696	47.03	12.94	13.79	75.86	.57	.36
19K	1,322	66.28	13.10	25.42	96.61	.54	.31
31B	5,121	65.04	9.31	31.58	91.26	.55	.45
42A	1,174	55.08	12.58	15.09	86.79	.55	.43
68W	3,652	72.90	10.41	25.51	92.86	.51	.27
88M	4,236	62.78	9.76	25.71	88.89	.55	.40
91B	720	58.69	11.93	27.66	90.72	.48	.31
All MOS Combined [a]	28,975	62.47	12.23	8.57	97.14	.54	.37
WTBD (Army-Wide)	37,738	62.41	12.42	6.45	97.30		.42
Tier 1							
MOS-Specific							
11B/C/X + 18X	10,281	59.56	10.88	23.33	86.67	.61	.43
12B	517	56.56	16.50	8.57	97.14	.59	.50
13D	298	54.31	15.94	8.82	85.29	.59	.41
13F	495	65.89	16.52	17.65	94.12	.55	.33
19D	672	47.11	12.88	13.79	75.86	.59	.38
19K	1,280	66.29	13.09	25.42	94.92	.54	.31
31B	4,979	65.03	9.31	31.58	91.26	.55	.45
42A	1,154	55.05	12.62	15.09	86.79	.55	.43
68W	3,543	72.91	10.43	25.51	92.86	.51	.27
88M	4,089	62.75	9.73	25.71	88.89	.55	.40
91B	696	58.62	11.82	27.66	90.72	.48	.32
All MOS Combined [a]	28,004	62.49	12.22	8.57	97.14	.54	.37
WTBD (Army-Wide)	36,426	62.40	12.43	6.45	97.30		.42
Tier 2							
MOS-Specific							
11B/C/X + 18X	422	58.74	11.26	26.67	86.67	.60	.36
31B	142	65.42	9.17	34.21	84.21	.58	.50
68W	109	72.59	9.66	32.65	88.04	.61	.30
88M	147	63.63	10.33	34.26	83.33	.60	.39
All MOS Combined [a]	971	62.00	12.47	17.24	97.06	.59	.33
WTBD (Army-Wide)	1,312	62.55	12.18	16.13	93.55		.36

Note. *M*s, *SD*s, *Min, and Max* reflect percent correct. WTBD = Warrior Tasks and Battle Drills. r_{WTBD} = correlation with WTBD JKT scores. r_{AFQT} = correlation with AFQT scores. Statistics for MOS with fewer than 100 cases are not reported. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Performance Rating Scales (PRS)

The PRS, like the JKTs, also were adapted from or based on previous research (see Moriarty et al., 2009 for details). The IMT and in-unit PRS use different formats, so they will be described separately.

IMT PRS

The IMT PRS target two domains of Soldier performance requirements: (a) Army-wide and (b) MOS-specific. The IMT PRS were completed by cadre members (drill sergeants, trainers) of participating Soldiers.

Over the course of the TOPS IOT&E, two versions of the IMT PRS were administered. Early IOT&E evaluations noted low interrater reliability (IRR) estimates for the PRS (Moriarty & Bynum, 2011). Accordingly, several changes were made to the IMT instruments in an effort to improve their psychometric characteristics. First, the number of scales for the Army-wide PRS was reduced from eight to five, paralleling the five scores generated from the original scales (Sparks & Peddie, 2013). No changes were made to the MOS-specific PRS scales; the number of scales ranged from five to nine, and a composite score was computed by averaging ratings across the individual scales for each MOS. Second, the rating scales for both the Army-wide and MOS-specific PRS were changed from a 7-point behaviorally anchored rating scale (BARS) to a 5-point relative scale format with scales ranging from 1 (Among the Weakest) to 5 (Among the Strongest). All IMT PRS results are based on data from both the initial and revised PRS, and are expressed on a 5-point scale.[9] Finally, cadre members also indicated their opportunity to observe each Soldier being rated using a 4-point "familiarity" scale. The initial PRS used a 3-point familiarity scale. This was changed to a 4-point scale to enable raters to more clearly indicate their ability to judge each Soldier's performance.

Although the revised PRS generally showed increased IRR relative to the initial versions, the reliability estimates were generally low for all versions of the PRS. The overall low estimates were likely due to multiple factors including rater fatigue, inability of rater to accurately differentiate among Soldiers, and the unproctored nature of the rating process. Moreover, previous research has found relatively low IRR estimates for military versus civilian samples (Van Iddekinge, Roth, Putka, & Lanivich, 2011). Additionally, the low IRRs may reflect raters viewing different samples of soldiers' performance, and as such some of the low consistency between-raters may reflect true differences in performance (e.g., Putka, Hoffman, & Carter, 2014). For detailed IRR estimates for the PRS, see Knapp and Wolters (2017).

Table 4.4 summarizes the descriptive statistics for IMT PRS by education tier. A Soldier's PRS ratings were not included in the analyses if the rater (a) indicated he or she had little opportunity to observe this Soldier, (b) omitted more than 10% of the assessment items, (c) indicated that he or she had not observed the Soldier on more than 50% of the dimensions, or (d) engaged in "flat responding"—that is, if the rater rated 10 or more Soldiers on a particular scale and 90% or more of those rating profiles were exactly the same. Mean ratings were above the mid-point, a

[9] The initial rating scale was converted from a 7-point scale to a 5-point scale by identifying meaningful cuts along the 7-point scale and comparing percentiles of the initial PRS to the new PRS to ensure the cuts points produced consistent percentiles in each group. The following conversions were used: 1.00-2.99 = 1; 3.00-4.99 = 2; 5.00-5.99 = 3; 6.00-6.99 = 4; 7.00 = 5.

consistent finding in prior Army research involving performance ratings (e.g., Campbell & Knapp, 2001; Knapp & Tremble, 2007; Moriarty & Bynum, 2011). The IMT PRS were also highly intercorrelated (see Appendix B).

Table 4.4. Performance Rating Scales (PRS) Descriptive Statistics in the IMT Validation Sample by Education Tier

Domain/PRS	*n*	*M*	*SD*	*Min*	*Max*
Tier 1 + Tier 2 (Combined)					
Army-Wide					
Adjustment to the Army	11,922	3.47	0.94	1.00	5.00
Effort & Discipline	11,920	3.35	0.96	1.00	5.00
MOS Qualification Knowledge	11,318	3.43	0.90	1.00	5.00
Physical Fitness & Bearing	11,820	3.37	0.94	1.00	5.00
Working with Others	11,868	3.38	0.95	1.00	5.00
Overall Performance	11,855	3.53	0.86	1.00	5.00
MOS-Specific					
11B/C/X + 18X	2,182	3.29	0.82	1.00	5.00
12B	330	2.98	0.54	1.17	5.00
13F	125	3.49	0.62	1.60	5.00
19D	293	2.96	0.57	1.13	4.75
19K	419	3.36	0.72	1.00	5.00
31B	1,599	3.33	0.69	1.00	5.00
42A	389	3.71	0.68	2.00	5.00
68W	1,038	3.13	0.89	1.00	5.00
88M	1,372	3.70	0.68	1.20	5.00
All MOS Combined [a]	7,877	3.35	0.78	1.00	5.00
Tier 1					
Army-Wide					
Adjustment to the Army	11,506	3.48	0.94	1.00	5.00
Effort & Discipline	11,503	3.35	0.96	1.00	5.00
MOS Qualification Knowledge	10,917	3.43	0.90	1.00	5.00
Physical Fitness & Bearing	11,410	3.37	0.94	1.00	5.00
Working with Others	11,457	3.38	0.95	1.00	5.00
Overall Performance	11,441	3.54	0.85	1.00	5.00
MOS-Specific					
11B/C/X + 18X	2,088	3.29	0.82	1.00	5.00
12B	319	2.96	0.53	1.17	5.00
13F	121	3.49	0.63	1.60	5.00
19D	276	2.96	0.58	1.13	4.75
19K	407	3.36	0.72	1.00	5.00
31B	1,563	3.33	0.69	1.00	5.00
42A	383	3.71	0.68	2.00	5.00
68W	1,005	3.13	0.89	1.00	5.00
88M	1,328	3.70	0.68	1.20	5.00
All MOS Combined [a]	7,617	3.35	0.78	1.00	5.00

Table 4.4. (Continued)

Domain/PRS	*n*	*M*	*SD*	*Min*	*Max*
		Tier 2			
Army-Wide					
Adjustment to the Army	416	3.35	0.97	1.00	5.00
Effort & Discipline	417	3.24	0.96	1.00	5.00
MOS Qualification Knowledge	401	3.35	0.86	1.00	5.00
Physical Fitness & Bearing	410	3.23	0.91	1.00	5.00
Working with Others	411	3.32	0.97	1.00	5.00
Overall Performance	414	3.37	0.94	1.00	5.00
MOS-Specific					
All MOS Combined [a]	260	3.22	0.72	1.00	5.00

Note. Ratings on PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Statistics for MOS with fewer than 100 cases are not reported.
[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

In-Unit PRS

The in-unit PRS only target Army-wide dimensions of performance (i.e., administration of MOS-specific in-unit PRS was discontinued early in the IOT&E) and include 13 performance dimensions, plus a Leadership Potential scale (see Table 4.5). One scale with poor psychometric properties was replaced in 2011 with the Adjustment to Army Life scale, comparable to the corresponding IMT scale. Ratings on several of the individual scales were combined to form four PRS composites and three scales were left as single-item dimensions. Cronbach's alpha coefficients for the in-unit PRS composite scales are reported in Table 4.5. The in-unit PRS have consistently employed the 7-point BARS format used for the initial IMT scales. The revised 4-point "familiarity" scale used in the new IMT PRS also is used with the in-unit PRS. The majority of Soldiers in units were rated by only one supervisor, so interrater reliability estimates were not calculated. Table 4.6 reports the basic descriptive statistics for the in-unit Army-wide PRS by performance domain and education tier.

Table 4.5. In-Unit Army-Wide Performance Rating Scale Dimensions and Composite Scores

In-Unit Rating Composites	α
Can Do	.90
Performing Core Warrior Tasks	
Performing MOS-Specific Tasks	
Processing Information	
Solving Problems	
Effort & Discipline	.79
Exhibiting Effort	
Exhibiting Personal Discipline	
Working with Others	.68
Communicating with Others	
Contributing to the Team	
Self-Management	.79
Following Safety Procedures	
Developing Own Skills	
Managing Personal Matters	

Table 4.5. (Continued)

In-Unit Rating Single Item Dimensions
Adjustment to Army Life
Physical Fitness and Bearing
Overall Leadership Potential Rating

Note. Of the seven performance ratings used in analyses, four are composites of multiple dimensions and three are single dimension ratings.

Table 4.6. Army-Wide Performance Rating Scales (PRS) Descriptive Statistics in the In-Unit Validation Sample

PRS Dimensions/Composites	*n*	*M*	*SD*	*Min*	*Max*
Tier 1 + Tier 2 (Combined)					
Can Do [a]	5,600	4.88	1.26	1.00	7.00
Effort & Discipline [a]	5,597	5.16	1.36	1.00	7.00
Physical Fitness & Bearing	5,627	5.26	1.54	1.00	7.00
Self-Management [a]	5,574	5.27	1.15	1.00	7.00
Working with Others [a]	5,599	5.27	1.22	1.00	7.00
Adjustment to Army Life	5,317	5.19	1.54	1.00	7.00
Overall Leadership Potential	5,518	4.71	1.68	1.00	7.00
Tier 1					
Can Do [a]	5,439	4.88	1.26	1.00	7.00
Effort & Discipline [a]	5,436	5.16	1.36	1.00	7.00
Physical Fitness & Bearing	5,466	5.27	1.54	1.00	7.00
Self-Management [a]	5,414	5.27	1.15	1.00	7.00
Working with Others [a]	5,438	5.27	1.23	1.00	7.00
Adjustment to Army Life	5,163	5.20	1.54	1.00	7.00
Overall Leadership Potential	5,360	4.71	1.68	1.00	7.00
Tier 2					
Can Do [a]	161	4.93	1.34	1.00	7.00
Effort & Discipline [a]	161	5.17	1.36	1.00	7.00
Physical Fitness & Bearing	161	5.12	1.62	1.00	7.00
Self-Management [a]	160	5.27	1.19	1.33	7.00
Working with Others [a]	161	5.22	1.21	1.00	7.00
Adjustment to Army Life	154	5.17	1.57	1.00	7.00
Overall Leadership Potential	158	4.76	1.56	1.00	7.00

Note. Ratings on PRS range from 1 and 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses.
[a] Ratings composites comprise two or more Army-wide PRS.

Army Life Questionnaire (ALQ)

The ALQ was designed to measure Soldiers' self-reported attitudes and experiences in the Army. Earlier forms of the training and in-unit versions of the ALQ (Van Iddekinge, Putka, & Sager, 2005) were modified slightly for use in the TOPS IOT&E. The ALQ includes scales that cover (a) Soldiers' commitment and retention-related attitudes and (b) Soldiers' performance and adjustment. The ALQ scales use several different formats. The Army Physical Fitness Test (APFT) score is a write-in single item. Training Achievements, Training Restarts, (both of which appear only on the IMT

version of the ALQ), and Disciplinary Incidents are simply a count of the "yes" responses to associated items. The remaining scales (see Table 4.7) are composed of Likert-type response scales and are scored by computing the mean of the constituent item scores. Most scales appear on both the IMT and in-unit versions of the scales, though the IMT version has two unique Likert-based scales (i.e., Normative Commitment and Army Life Adjustment) and the in-unit version has one unique Likert-based scale (i.e., MOS satisfaction).

ALQ data were flagged as unusable if the Soldier (a) omitted more than 10% of the assessment items, (b) took fewer than five minutes to complete the entire assessment, or (c) chose an implausible response to the careless responding item. APFT scores were dropped if less than 180, which suggests the score was being reported in error. Tables 4.8 and 4.9 summarize the descriptive statistics for the ALQ scales by education tier for the IMT and in-unit samples, respectively.

Table 4.7. Army Life Questionnaire (ALQ) Likert-Type Scales and Reliability Estimates

Scale Name	Description	Number of Items	Example Item	Likert Scale Anchors	IMT α	In-Unit α
Affective Commitment	Measures Soldiers' emotional attachment to the Army.	7	I feel like I am part of the Army 'family.'	1 (strongly disagree) to 5 (strongly agree)	.86	.88
Normative Commitment [a]	Measures Soldiers' feelings of obligation toward staying in the Army until the end of their current term of service.	5	I would feel guilty if I left the Army before the end of my current term of service.	1 (strongly disagree) to 5 (strongly agree)	.78	
Career Intentions	Measures Soldiers' intentions to reenlist and to make the Army a career.	3	How likely is it that you will make the Army a career?	Varies by item: 1 (strongly disagree) to 5 (strongly agree); 1 (not at all confident) to 5 (extremely confident); 1 (extremely unlikely) to 5 (extremely likely)	.91	.92
Reenlistment Intentions	Measures Soldiers' intention to reenlist in the Army.	4	How likely is it that you will leave the Army after completing your current term of service?	1 (strongly disagree) to 5 (strongly agree)	.82	.79
Attrition Cognitions	Measures the degree to which Soldiers think about attriting before the end of their first term.	4	How likely is it that you will complete your current term of service?	Varies by item: 1 (strongly disagree) to 5 (strongly agree); 1 (never) to 5 (very often)	.75	.76
Army Life Adjustment [a]	Measures Soldiers' transition from civilian to Army life.	9	Looking back, I was not prepared for the challenges of training in the Army.	1 (strongly disagree) to 5 (strongly agree)	.88	
MOS Fit	Measures Soldiers' perceived fit with their MOS.	9	My MOS provides the right amount of challenge for me.	1 (strongly disagree) to 5 (strongly agree)	.92	.93
Army Fit [b]	Measures Soldiers' perceived fit with the Army.	8	The Army is a good match for me.	1 (strongly disagree) to 5 (strongly agree)	.86	.81
MOS Satisfaction [c]	Measures Soldiers' satisfaction with their MOS	9	My MOS allows me to perform the kind of work I want to do.	1 (strongly disagree) to 5 (strongly agree)		.92

Note. α = coefficient alpha.
[a] Appears only on the IMT ALQ.
[b] Scale has six items on the in-unit ALQ.
[c] Appears only on the in-unit ALQ.

Table 4.8. Army Life Questionnaire (ALQ) Descriptive Statistics in the IMT Validation Sample by Education Tier

Domain/Scale	*n*	*M*	*SD*	*Min*	*Max*
Tier 1 + Tier 2 (Combined)					
Retention					
Army Career Intentions	41,151	3.22	1.09	1.00	5.00
Affective Commitment	41,151	3.90	0.67	1.00	5.00
Army Fit	41,151	4.09	0.60	1.00	5.00
Army Reenlistment Intentions	41,151	3.51	0.94	1.00	5.00
Attrition Cognition	41,151	1.52	0.59	1.00	5.00
MOS Fit	41,151	3.73	0.83	1.00	5.00
Army Life Adjustment	41,151	4.08	0.67	1.00	5.00
Normative Commitment	41,151	4.17	0.69	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	39,355	0.31	0.64	0.00	7.00
Disciplinary Incidents (Y/N)	39,355	0.24	0.43	0.00	1.00
APFT Score	39,729	252.39	27.94	180.00	300.00
Training Achievement (#)	41,064	0.38	0.58	0.00	2.00
Training Restarts (#) [a]	40,462	0.09	0.31	0.00	2.00
Tier 1					
Retention					
Army Career Intentions	39,696	3.21	1.08	1.00	5.00
Affective Commitment	39,696	3.90	0.67	1.00	5.00
Army Fit	39,696	4.09	0.60	1.00	5.00
Army Reenlistment Intentions	39,696	3.50	0.94	1.00	5.00
Attrition Cognition	39,696	1.52	0.59	1.00	5.00
MOS Fit	39,696	3.73	0.83	1.00	5.00
Army Life Adjustment	39,696	4.08	0.67	1.00	5.00
Normative Commitment	39,696	4.17	0.69	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	37,946	0.30	0.63	0.00	7.00
Disciplinary Incidents (Y/N)	37,946	0.24	0.43	0.00	1.00
APFT Score	38,338	252.65	27.92	180.00	300.00
Training Achievement (#)	39,610	0.39	0.58	0.00	2.00
Training Restarts (#) [a]	39,034	0.09	0.31	0.00	2.00
Tier 2					
Retention					
Army Career Intentions	1,455	3.47	1.10	1.00	5.00
Affective Commitment	1,455	4.02	0.67	1.00	5.00
Army Fit	1,455	4.16	0.62	1.50	5.00
Army Reenlistment Intentions	1,455	3.68	0.94	1.00	5.00
Attrition Cognition	1,455	1.46	0.59	1.00	5.00
MOS Fit	1,455	3.81	0.82	1.00	5.00
Army Life Adjustment	1,455	4.13	0.66	1.22	5.00
Normative Commitment	1,455	4.26	0.68	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	1,409	0.37	0.76	0.00	6.00
Disciplinary Incidents (Y/N)	1,409	0.25	0.44	0.00	1.00
APFT Score	1,391	245.24	27.62	180.00	300.00
Training Achievement (#)	1,454	0.36	0.57	0.00	2.00
Training Restarts (#) [a]	1,428	0.11	0.35	0.00	2.00

[a] Training Restarts (#) is based on the total number of affirmative responses to whether a Soldier restarted from Basic Combat Training (BCT) or One Station Unit Training (OSUT) or whether a Soldier repeated a block or module at AIT or OSUT.

Table 4.9. Army Life Questionnaire (ALQ) Descriptive Statistics in the In-Unit Validation Sample by Education Tier

Domain/Setting/Scale	*n*	*M*	*SD*	*Min*	*Max*
Tier 1 + Tier 2 (Combined)					
Retention					
Army Career Intentions	6,964	2.54	1.20	1.00	5.00
Affective Commitment	6,964	3.53	0.81	1.00	5.00
Army Fit	6,964	3.84	0.72	1.00	5.00
Army Reenlistment Intentions	6,964	2.95	1.18	1.00	5.00
Attrition Cognition	6,964	1.77	0.77	1.00	5.00
MOS Fit	6,964	3.21	0.93	1.00	5.00
MOS Satisfaction	6,964	3.46	0.92	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	6,962	0.43	0.90	0.00	7.00
Disciplinary Incidents (Y/N)	6,962	0.26	0.44	0.00	1.00
APFT Score	6,672	253.84	27.91	180.00	300.00
Tier 1					
Commitment & Fit					
Army Career Intentions	6,759	2.53	1.19	1.00	5.00
Affective Commitment	6,759	3.52	0.81	1.00	5.00
Army Fit	6,759	3.83	0.72	1.00	5.00
Army Reenlistment Intentions	6,759	2.94	1.18	1.00	5.00
Attrition Cognition	6,759	1.77	0.77	1.00	5.00
MOS Fit	6,759	3.21	0.93	1.00	5.00
MOS Satisfaction	6,759	3.46	0.92	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	6,757	0.42	0.88	0.00	7.00
Disciplinary Incidents (Y/N)	6,757	0.26	0.44	0.00	1.00
APFT Score	6,476	253.89	27.97	180.00	300.00
Tier 2					
Commitment & Fit					
Army Career Intentions	205	2.67	1.26	1.00	5.00
Affective Commitment	205	3.63	0.91	1.00	5.00
Army Fit	205	3.90	0.79	1.67	5.00
Army Reenlistment Intentions	205	3.10	1.20	1.00	5.00
Attrition Cognition	205	1.78	0.87	1.00	5.00
MOS Fit	205	3.24	0.98	1.00	5.00
MOS Satisfaction	205	3.48	0.89	1.00	5.00
Achievement/Performance					
Disciplinary Incidents (#)	205	0.64	1.24	0.00	7.00
Disciplinary Incidents (Y/N)	205	0.32	0.47	0.00	1.00
APFT Score	196	252.26	25.85	181.00	300.00

Administrative Criteria

Attrition

Attrition is a broad category that encompasses involuntary and voluntary separations for a variety of reasons (e.g., underage enlistment, conduct, family concerns, drugs or alcohol, performance, physical standards or weight, mental disorder, or violations of the Uniform Code of Military Justice [UCMJ]). The reason for separation was determined by the Soldiers' Separation Program Designator (SPD) code. Soldiers who left the Army for reasons outside of their or the Army's control (e.g., death or serious injury incurred while performing one's duties) were excluded from our analyses. Separation data are reported for regular Army Soldiers only. The current analyses cover attrition through 36 months of service. Table 4.10 summarizes the basic descriptive statistics for attrition by education tier.

Training Restarts

Soldiers' IMT completion status and whether they graduated from IMT with training restarts or failures were extracted from ATRRS (Army Training Requirements and Resources System). IMT restarts identify Soldiers with at least one restart (i.e., must begin training again) during IMT. Training failures identify Soldiers that graduated IMT with at least one failure (i.e., failed a component of training). Failures are further divided into failures that were due to academic reasons versus those that were due to pejorative reasons. Soldiers who had not had an opportunity to complete their IMT at the time data were extracted were excluded from analyses. Table 4.11 presents the base rates of Soldiers with at least one training restart or training failure during IMT.

AIT Grade

Final AIT Grade represents the cumulative grade across all courses administratively recorded for the Soldier in the RITMS (Resident Individual Training Management System) database. We compute a standardized version of Final AIT Grade by standardizing each course grade for courses with 15 or more Soldiers. We have not been able to access RITMS data for some time, so this variable is currently only available for older cases in the TOPS database. Note that final grades from One Station Unit Training (OSUT) courses are excluded from the data file because the variance in the grades is highly restricted or based on a pass-fail metric that is redundant with data from ATRRS (Army Training Requirements and Resources System).

Criterion Composites

A number of the criterion scales measure similar underlying constructs. Composites of these criterion scales were developed to reduce the number of criteria used to validate the TAPAS and simplify the interpretation of results, without sacrificing information. The four composites of Overall Performance, Commitment & Fit, Retention Cognitions, and Knowledge & Skill were constructed using theoretical rationale and examined using confirmatory factor analysis (CFA) (Bynum & Beatty, 2014). Can Do Performance and Will Do Performance composites were constructed using rational judgment, exploratory factor analyses (EFA), and CFA, and were intended to encapsulate performance criteria associated with the ability to do the job and the motivation to consistently perform well, respectively (as referenced in Chapter 3). Table 4.12 lists the IMT and in-unit criterion composites, the scales

included in each composite, and a brief description of how the composite was constructed. Descriptive statistics for the IMT and in-unit criterion composites are shown in Table 4.13.

Table 4.10. Base Rates for Attrition Criteria for Regular Army Soldiers in the Validation Sample by Education Tier

	Tier 1 + Tier 2 (Combined)			Tier 1			Tier 2		
Cumulative Attrition	*n*	n_{Attrit}	$\%_{Attrit}$	*n*	n_{Attrit}	$\%_{Attrit}$	*n*	n_{Attrit}	$\%_{Attrit}$
6-Month	227,990	24,168	10.6	220,433	23,010	10.4	7,557	1,158	15.3
12-Month	202,838	26,948	13.3	196,098	25,631	13.1	6,740	1,317	19.5
24-Month	161,493	31,255	19.4	156,456	29,869	19.1	5,037	1,386	27.5
36-Month	115,043	30,416	26.4	111,201	29,015	26.1	3,842	1,401	36.5

Note. n = number of Soldiers with attrition data at the time data were extracted. n_{Attrit} = number of Soldiers who attrited at the specified months of service. $\%_{Attrit}$ = percentage of Soldiers who attrited through the specified months of service [(n_{Attrit} /n) x 100].

Table 4.11. Base Rates or Descriptive Statistics for Administrative IMT Criteria in the Validation Sample

	Tier 1 + Tier 2 (Combined)			Tier 1			Tier 2		
Restarted Initial Military Training (IMT)	*n*	$n_{Restarted}$	$\%_{Restarted}$	*n*	$n_{Restarted}$	$\%_{Restarted}$	*n*	$n_{Restarted}$	$\%_{Restarted}$
IMT Restarts	477,549	24,625	5.2	459,268	23,505	5.1	18,281	1,120	6.1
Training Failures	288,938	40,607	14.1	277,467	38,358	13.8	11,471	2,249	19.6
For Pejorative Reasons	285,232	36,684	12.9	273,956	34,638	12.6	11,276	2,046	18.1
For Academic Reasons	278,547	30,173	10.8	267,863	28,713	10.7	10,684	1,460	13.7

Note. n = number of Soldiers with IMT data at the time data were extracted. $n_{Restarted}$ = number of Soldiers who restarted at least once during IMT. $\%_{Restarted}$ = percentage of Soldiers who restarted at least once during IMT [($n_{Restarted}$ /n) x 100]. Standardization excludes MOS courses with insufficient sample size (n < 15).

Table 4.12. IMT and In-Unit Criterion Composite Scores

IMT		
Criterion Score	Scales	Description
Overall Performance	PRS: Army Adjustment PRS: Effort and Discipline PRS: MOS Qualification PRS: Physical Fitness PRS: Working with Others PRS: MOS Specific	General effort/ motivation criterion. Scales are averaged to form the composite.
Commitment & Fit	ALQ: Affective Commitment ALQ: Normative Commitment ALQ: General MOS Fit ALQ: Army Fit	General commitment to and fit with the Army. Scales are averaged to form the composite.
Retention Cognitions	ALQ: Army Career Intentions ALQ: Army Re-enlistment ALQ: Attrition Cognition	General intentions of continuance in the Army. Scales are averaged to form the composite.
Knowledge & Skill	WTBD JKT MOS JKT AIT Grade	WTBD JKT and MOS JKT are averaged to form an overall knowledge/skill composite. For those that do not have an MOS JKT score, AIT grade is substituted when available.
Can Do Performance	Army-Wide JKT MOS JKT	Total score of WTBD JKT and MOS JKT
Will Do Performance	Average Army-Wide PRS [a] MOS-Specific PRS APFT Score Average ALQ [b] Training Achievement Training Failures (#) Disciplinary Incidents (#)	The seven scales are standardized and then summed to produce the composite.
In-Unit		
Overall Performance	PRS: Can Do PRS: Effort and Discipline PRS: Working with Others PRS: Self-Management PRS: Physical Fitness and Bearing	General effort/ motivation criterion. Scales are averaged to form the composite.
Commitment & Fit	ALQ: Affective Commitment ALQ: General MOS Fit ALQ: Army Fit	General commitment to and fit with the Army. Scales are averaged to form the composite.
Retention Cognitions	ALQ: Army Career Intentions ALQ: Army Re-enlistment ALQ: Attrition Cognition	General intentions of continuance in the Army. Scales are averaged to form the composite.
Knowledge & Skill	WTBD JKT MOS JKT	WTBD JKT and MOS JKT are averaged to form an overall knowledge/skill composite. For those that do not have MOS JKT, only WTBD JKT scores are used.

Note. We do not currently have access to administrative records containing AIT grade data, but previously obtained AIT data are used in computing criterion composites for older cases in the longitudinal database. Similarly, MOS-specific JKTs are no longer administered in-unit, but criterion composites for older cases in the database include these scores.

[a] Army-Wide PRS scales included in the average: Army Adjustment, Effort and Discipline, MOS Qualification, Physical Fitness, Working with Others, and Overall Performance.

[b] ALQ scales included in the average: Affective Commitment, Normative Commitment, Career Intentions, Re-enlistment Intentions, Attrition Cognition, Army Life Adjustment, and MOS Fit.

Table 4.13. Criterion Composite Descriptive Statistics in the IMT and In-Unit Validation Samples by Education Tier

Domain/Measure	*n*	*M*	*SD*	*Min*	*Max*
Tier 1 + Tier 2 (Combined)					
IMT					
Overall Performance	11,272	3.42	0.76	1.00	5.00
Commitment & Fit	41,151	3.97	0.58	1.00	5.00
Retention Cognitions	41,151	2.75	0.58	1.00	4.33
Knowledge & Skill [a]	28,985	0.01	0.86	-3.67	2.27
Can Do Performance [a]	37,946	-0.07	1.61	-7.34	4.53
Will Do Performance [a]	6,450	0.11	3.07	-15.31	8.81
In-Unit					
Overall Performance	5,588	5.17	1.15	1.00	7.00
Commitment & Fit	6,964	3.52	0.68	1.00	5.00
Retention Cognitions	6,964	2.42	0.67	1.00	4.14
Knowledge & Skill [a]	6,836	-0.09	0.96	-4.45	2.30
Tier 1					
IMT					
Overall Performance	10,875	3.42	0.76	1.00	5.00
Commitment & Fit	39,696	3.97	0.58	1.00	5.00
Retention Cognitions	39,696	2.74	0.58	1.00	4.33
Knowledge & Skill [a]	28,006	0.01	0.86	-3.67	2.27
Can Do Performance [a]	36,627	-0.07	1.61	-7.34	4.53
Will Do Performance [a]	6,241	0.12	3.06	-15.31	8.81
In-Unit					
Overall Performance	5,427	5.17	1.15	1.00	7.00
Commitment & Fit	6,759	3.52	0.68	1.00	5.00
Retention Cognitions	6,759	2.41	0.67	1.00	4.14
Knowledge & Skill [a]	6,637	-0.09	0.96	-4.45	2.30
Tier 2					
IMT					
Overall Performance	397	3.31	0.75	1.14	5.00
Commitment & Fit	1,455	4.06	0.59	1.13	5.00
Retention Cognitions	1,455	2.87	0.58	1.00	4.00
Knowledge & Skill [a]	979	0.03	0.89	-3.64	2.15
Can Do Performance [a]	1,319	-0.04	1.63	-7.28	4.30
Will Do Performance [a]	209	-0.43	3.17	-12.98	7.71
In-Unit					
Overall Performance	161	5.15	1.17	1.06	7.00
Commitment & Fit	205	3.59	0.77	1.41	5.00
Retention Cognitions	205	2.52	0.67	1.00	4.00
Knowledge & Skill [a]	199	0.02	0.97	-3.37	2.03

Note. Overall Performance scores for IMT Soldiers are on a 5-point scale. Overall Performance scores for in-unit Soldiers are on a 7-point scale.

[a] The variables that are included in the criterion composites are reported on a standardized *z*-score scale (mean = 0).

Summary

Criterion data, such as attrition and training restarts, were gathered from administrative records. In addition, three types of criterion measures were adapted from previous Army research to validate the TAPAS: (a) the JKTs, (b) the PRS, and (c) the ALQ. The JKTs were combined with administrative records of AIT grades to form a Knowledge/Skill composite intended to measure a Soldier's task-specific knowledge. The PRS are completed by training cadre (IMT) or supervisors (in-unit) and measure Army-wide constructs such as effort and leadership and (for selected IMT MOS) MOS-specific competence. The PRS were combined to form an Overall Performance composite intended to measure cadre and/or supervisor ratings of a Soldier's general performance level. The ALQ asks Soldiers to complete verifiable self-report performance items (e.g., their APFT scores) and self-report attitudinal items (e.g., adjustment to Army life). For the validation analyses, the ALQ scales were combined to form a Commitment & Fit composite and a Retention Cognitions composite. Finally, two criterion composites were created to measure general Can Do and Will Do performance.

In general, the criterion measures described in this chapter exhibited acceptable and theoretically consistent psychometric properties. Nearly all reliability estimates for the JKTs and ALQ scales are acceptable and correlations among the scales are all in the theoretically consistent direction. (see Appendixes B and C). The correlations between IMT MOS-specific JKTs and AFQT scores ranged from moderate (r = .27) to strong (r = .50). In addition, MOS-specific JKTs correlated strongly with WTBD JKT scores. The exception to this was the Army-wide and MOS-specific PRS in IMT, which continued to exhibit low interrater reliability coefficients. Lower interrater reliability is not uncommon in military samples (Van Iddekinge et al., 2011) and despite the low reliability, both the current and past research have shown meaningful relationships between non-cognitive predictors and performance ratings (e.g., Knapp & Heffner, 2009; McHenry, Hough, Toquam, Hanson, & Ashworth, 1990). Because unreliability can attenuate correlations, this should be considered when interpreting results involving the PRS.

Regarding the criterion scores used to validate the TAPAS predictor composites, the intent was to use criterion scores that would best measure performance aspects predicted by each of the three predictor composite scores. As further discussed in Chapter 3, the Can-Do predictor composite was constructed to predict technical training performance, which is captured by JKT scores and AIT grades. The Will-Do predictor composite was constructed to predict motivation-based performance, which is captured by APFT, the PRS, and the ALQ criteria. The Adaptation predictor composite was constructed to predict attrition. Attrition is captured through administrative records of attrition and self-report measures of retention cognition. Chapter 5 summarizes the validation results examining the relationships between the predictor composites and these criteria.

CHAPTER 5: EVIDENCE FOR THE PREDICTIVE VALIDITY OF THE TAPAS

Michael G. Hughes (HumRRO)

This chapter evaluates the potential of the TAPAS to predict Soldiers' performance and retention through their first enlistment term. We begin with a brief description of our analytic approach. Next, we summarize the main findings from incremental validity analyses of the (a) current TAPAS composites (Can-Do, Will-Do, Adaptation) and (b) criterion-specific TAPAS scales. Lastly, we discuss analyses that examined Soldier performance based on AFQT and TAPAS scores. Specifically, these analyses focused on (a) IMT and attrition outcomes based on Soldiers' standing on AFQT categories and their performance on the TAPAS and (b) in-unit outcomes based on Soldiers' percentile scores on the TAPAS.

Analytic Approach

To evaluate the TAPAS' potential to enhance new Soldier selection, we examined the incremental validity of the TAPAS over the AFQT in predicting first-term outcomes important to the Army. Consistent with the Army's personnel goals, we examined performance and retention-related outcomes that, as a group, provide representative coverage of the criterion space (Campbell, Hanson, & Oppler, 2001; Campbell, McHenry, & Wise, 1990; Knapp & Tremble, 2007; Strickland, 2005).

Our analysis approach was generally consistent with previous evaluations of the TAPAS and similar experimental non-cognitive predictors (e.g., Ingerick et al., 2009; Knapp & Heffner, 2009; 2010; Trippe, Caramagno, Allen, & Ingerick, 2011). In brief, this approach involved testing a series of two-step hierarchical regression models, where scores on each criterion measure or composite were regressed onto Soldiers' AFQT scores in the first step, followed by scores on either the (a) TAPAS composites or (b) TAPAS scales in the second step. In each case, we evaluated the degree to which adding the predictor(s) in the second step provided incremental validity beyond the AFQT with respect to the criterion of interest.

A series of regression models were estimated for each criterion measure. Outcomes were examined in relation to each of the three TAPAS composites added in the second step of the model. Estimates for the TAPAS composite models capture the predictive potential of the composites as configured for operational usage. The TAPAS composite models were estimated using a combined Tier 1 and 2 sample as well as separately by education tier where sample sizes were greater than 100. Attrition criteria were examined for Regular Army Soldiers only. Table 5.1 provides a summary of each of the regression models.

Additionally, we conducted another set of regression analyses using the individual TAPAS scales instead of the composites. For this final set of regression models, the specific predictor scales varied depending on the specific criterion being examined. For Knowledge and Skill, Warrior Tasks and Battle Drills Job Knowledge Test (WTBD JKT), and Can Do Performance (i.e., Can Do criteria), the Can-Do TAPAS scales were included in the second step. For Army Fit, Army Life Adjustment, Commitment and Fit, Retention Cognitions, APFT Score, Will Do Performance, Disciplinary Incidents, IMT Restarts, and the Performance Rating Scales (PRS) of PRS: Effort and Discipline, PRS: Adjustment to the Army, PRS: Physical Fitness and Bearing,

PRS: Working with Others, and PRS: Overall Performance (i.e., Will Do criteria), the Will-Do TAPAS scales were included in the second step. For the attrition criteria examined at 6, 12, and 24 months, the Adaptation TAPAS scales were added in the second step. The TAPAS scale models were estimated using a combined Tier 1 and 2 sample.

Table 5.1. Summary of Regression Models Evaluated for each Criterion

Model	Step 2 Predictors	# of Predictors added in Step 2	Description
1	TAPAS Can-Do Composite	1	The TAPAS Can-Do composite is a single variable based on scores from multiple TAPAS scales, and it was added to the model in Step 2.
2	TAPAS Will-Do Composite	1	The TAPAS Will-Do composite is a single variable based on scores from multiple TAPAS scales, and it was added to the model in Step 2.
3	TAPAS Adaptation Composite	1	The TAPAS Adaptation composite is a single variable based on scores from multiple TAPAS scales, and it was added to the model in Step 2.
4	TAPAS Facet Scales		
	DV: Can Do Criteria	6	For models predicting Can Do criteria, the TAPAS scales that comprise the TAPAS Can-Do composite were added in Step 2.
	DV: Will Do Criteria	4	For models predicting Will Do criteria, the TAPAS scales that comprise the TAPAS Will-Do composite were added in Step 2.
	DV: Attrition	4	For models predicting Attrition, the TAPAS scales that comprise the TAPAS Adaptation composite were added in Step 2.

Note. DV: Dependent Variable. All regression models included the AFQT as the only predictor in Step 1. The TAPAS Can-Do, Will-Do, and Adaptation composites each represent single variables comprising multiple TAPAS scales. Models 1 through 3 were conducted for every criterion variable. For Model 4 (TAPAS Scales), the predictors added in Step 2 varied depending on the type of criteria. For security reasons, the specific TAPAS scales that form each composite are not provided here.

In the present report, models predicting continuously scaled criteria were estimated using Ordinary Least Squares (OLS) regression. Logistic regression was used for the dichotomous criteria (i.e., attrition, Disciplinary Incidents, IMT Restarts). [10] Note that because different regression methods are required for different types of criteria (i.e., continuous vs. dichotomous), the statistical indices used to evaluate the OLS and logistic models also are different. Additional details concerning the specific indices presented for the logistic regression analyses are provided in the section on dichotomous outcomes later in the chapter.

In addition to the incremental validity analyses, we examined the predictive validity of the individual TAPAS scales based on the bivariate correlations between scores on the TAPAS scales and the selected criterion measures. The results of these analyses are presented in Appendix D.

[10] The dichotomous version of Disciplinary Incidents (0 = no disciplinary incidents; 1 = one or more disciplinary incidents) was used for all analyses due to a low base rate beyond one incident.

Findings

Results of these analyses are organized by criterion domain: (a) IMT performance, (b) in-unit performance, and (c) dichotomous outcomes. A few notes related to interpretation of the findings are in order:

- The results for Tier 2 Soldiers should be interpreted with caution at this stage of the TOPS evaluation because of limited criterion data for those Soldiers. Accordingly, our discussion primarily focuses on the analyses of the combined Tier 1 and 2 sample of Soldiers.[11]

- Results of OLS regression analyses are discussed with respect to *R* values for all continuous criteria. Results of logistic regression analyses are discussed with respect to odds ratios (ORs) in combination with likelihood ratio χ^2 tests of change in model fit (i.e., deviance).

- Much of our discussion focuses on the TAPAS composite models because these models best evaluate the TAPAS in an operational format. Similarly, tables of results included in this chapter include models of the TAPAS composites only. However, results of the criteria-specific TAPAS scales models are graphically displayed and briefly discussed.

Predicting IMT Performance

Tables 5.2 to 5.4 summarize the incremental validity results of the TAPAS composites for predicting IMT performance criteria over and above the AFQT. Overall, the results suggest that both the Will-Do and Adaptation TAPAS composites can enhance the Army's ability to predict a number of important outcomes. Below, we describe the specific outcomes for which the TAPAS composites demonstrated notable predictive gains beyond the AFQT alone.

With respect to the motivation-based performance criteria, the TAPAS composites exhibited gains in predictive validity over the AFQT in predicting several outcomes. In the combined Tier 1 and 2 sample, the TAPAS Will-Do composite enhanced the prediction of the Will Do Performance composite (ΔR = .21), APFT Score (ΔR = .16), Commitment and Fit (ΔR = .10), Army Life Adjustment (ΔR = .14); and to a lesser extent, the prediction of Army Fit (ΔR = .09) and the Physical Fitness and Bearing PRS (ΔR = .09).

The TAPAS Adaptation composite also demonstrated incremental validity in the prediction of the Will Do Performance composite (ΔR = .10), APFT Score (ΔR = .09), and PRS: Physical Fitness and Bearing (ΔR = .05) in the combined sample. The Can-Do composite did not demonstrate any notable incremental validity in either the combined or Tier 1 samples for any of the motivation-based outcomes. However, it is not designed to predict Will Do criteria.

[11] Due to the large proportion of Tier 1 Soldiers relative to Tier 2 Soldiers, results for the combined Tier 1 and Tier 2 sample were generally comparable to Tier 1 only results.

Table 5.2. Incremental Validity Estimates for the TAPAS over AFQT for Predicting IMT Technical Performance by Education Tier

IMT Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
Knowledge & Skill	*n = 21,109 - 27,339*			*n = 20,425 - 26,431*			*n = 684 - 908*		
Can-Do [a]	**.45**	**.46**	**.00**	**.45**	**.46**	**.00**	**.40**	**.40**	.00
Will-Do	**.45**	**.45**	**.00**	**.45**	**.45**	.00	**.41**	**.41**	.00
Adaptation	**.45**	**.45**	**.00**	**.45**	**.45**	**.00**	**.41**	**.41**	.00
WTBD JKT	*n = 27,126 - 35,634*			*n = 26,191 - 34,407*			*n = 935 - 1,227*		
Can-Do [a]	**.42**	**.42**	**.00**	**.42**	**.42**	**.00**	**.35**	**.36**	.00
Will-Do	**.42**	**.42**	.00	**.42**	**.42**	.00	**.37**	**.37**	.00
Adaptation	**.42**	**.42**	.00	**.42**	**.42**	.00	**.37**	**.37**	.00
Can Do Performance	*n = 27,303 - 35,829*			*n = 26,362 - 34,596*			*n = 941 - 1,233*		
Can-Do [a]	**.44**	**.44**	**.00**	**.44**	**.44**	**.00**	**.37**	**.37**	.00
Will-Do	**.43**	**.43**	**.00**	**.44**	**.44**	**.00**	**.38**	**.38**	.00
Adaptation	**.43**	**.43**	**.00**	**.44**	**.44**	**.00**	**.38**	**.38**	.00

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. *R* = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.
[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Table 5.3. Incremental Validity Estimates for the TAPAS over AFQT for Predicting IMT Adjustment, Commitment & Fit, Fitness, and Retention Criteria by Education Tier

IMT Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
Army Fit	*n = 29,754 - 38,861*			*n = 28,708 - 37,497*			*n = 1,046 - 1,364*		
Can-Do [a]	**.03**	**.05**	**.01**	**.03**	**.05**	**.01**	.03	.03	.00
Will-Do	**.03**	**.13**	**.09**	**.03**	**.13**	**.09**	.03	**.12**	**.09**
Adaptation	**.03**	**.04**	**.01**	**.03**	**.04**	**.01**	.03	.03	.00
Army Life Adjustment	*n = 29,754 - 38,861*			*n = 28,708 - 37,497*			*n = 1,046 - 1,364*		
Can-Do [a]	**.05**	**.09**	**.03**	**.06**	**.09**	**.03**	.02	.02	.00
Will-Do	**.06**	**.20**	**.14**	**.06**	**.20**	**.14**	.01	**.17**	**.16**
Adaptation	**.06**	**.10**	**.04**	**.06**	**.10**	**.04**	.01	.03	.02
Commitment & Fit	*n = 29,754 - 38,861*			*n = 28,708 - 37,497*			*n = 1,046 - 1,364*		
Can-Do [a]	.01	**.03**	**.02**	.01	**.03**	**.02**	.01	.04	.03
Will-Do	.01	**.11**	**.10**	.01	**.11**	**.10**	.01	**.11**	**.11**
Adaptation	.01	**.03**	**.02**	.01	**.03**	**.02**	.01	.01	.00
Retention Cognitions	*n = 29,754 - 38,861*			*n = 28,708 - 37,497*			*n = 1,046 - 1,364*		
Can-Do [a]	**.13**	**.14**	**.01**	**.13**	**.14**	**.01**	**.10**	**.10**	.00
Will-Do	**.13**	**.14**	**.00**	**.14**	**.14**	**.00**	**.10**	**.13**	**.03**
Adaptation	**.13**	**.14**	**.00**	**.14**	**.14**	**.00**	**.10**	**.11**	.01
APFT Score	*n = 28,683 - 37,497*			*n = 27,685 - 36,195*			*n = 998 - 1,302*		
Can-Do [a]	**.09**	**.09**	**.01**	**.09**	**.09**	**.01**	.03	.03	.00
Will-Do	**.09**	**.25**	**.16**	**.09**	**.25**	**.16**	.04	**.23**	**.19**
Adaptation	**.09**	**.18**	**.09**	**.09**	**.18**	**.09**	.04	**.13**	**.09**
Will Do Performance	*n = 4,972 - 6,015*			*n = 4,818 - 5,820*			*n = 154 - 195*		
Can-Do [a]	**.04**	**.05**	.01	**.03**	**.04**	.01	.11	.13	.01
Will-Do	**.05**	**.26**	**.21**	**.05**	**.26**	**.21**	.13	**.27**	**.14**
Adaptation	**.05**	**.15**	**.10**	**.05**	**.15**	**.11**	.13	**.18**	.04

Note. R = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Table 5.4. Incremental Validity Estimates for the TAPAS over AFQT for Predicting IMT Performance Rating Criteria by Education Tier

IMT Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
PRS: Effort and Discipline	*n = 8,803 - 11,201*			*n = 8,507 - 10,808*			*n = 296 - 393*		
Can-Do [a]	**.03**	**.03**	.00	**.03**	**.03**	.00	.10	.10	.00
Will-Do	**.06**	**.09**	**.03**	**.05**	**.09**	**.03**	**.12**	**.18**	**.06**
Adaptation	**.06**	**.07**	**.01**	**.05**	**.07**	**.02**	**.12**	.12	.00
PRS: Adjustment to the Army	*n = 8,802 - 11,203*			*n = 8,507 - 10,811*			*n = 295 - 392*		
Can-Do [a]	**.02**	.02	.00	.02	.02	.00	.08	.09	.01
Will-Do	**.04**	**.09**	**.05**	**.04**	**.09**	**.05**	.09	.11	.02
Adaptation	**.04**	**.06**	**.02**	**.04**	**.06**	**.02**	.09	.09	.00
PRS: Physical Fitness and Bearing	*n = 8,707 - 11,103*			*n = 8,416 - 10,716*			*n = 291 - 387*		
Can-Do [a]	.01	.02	.01	.01	.02	.01	.04	.05	.01
Will-Do	**.03**	**.12**	**.09**	**.03**	**.12**	**.09**	.06	**.14**	**.07**
Adaptation	**.03**	**.09**	**.05**	**.03**	**.09**	**.05**	.06	.07	.00
PRS: Working with Others	*n = 8,766 - 11,149*			*n = 8,475 - 10,762*			*n = 291 - 387*		
Can-Do [a]	.00	.00	.00	.00	.00	.00	.09	.09	.00
Will-Do	**.03**	**.08**	**.04**	**.03**	**.07**	**.04**	**.13**	**.17**	**.04**
Adaptation	**.03**	**.05**	**.02**	**.03**	**.05**	**.02**	**.13**	**.13**	.00
PRS: Overall Performance	*n = 8,442 - 10,596*			*n = 8,157 - 10,222*			*n = 285 - 374*		
Can-Do [a]	**.04**	**.04**	.00	**.04**	**.04**	.00	**.12**	.13	.01
Will-Do	**.06**	**.11**	**.05**	**.06**	**.11**	**.05**	**.14**	**.18**	**.04**
Adaptation	**.06**	**.08**	**.02**	**.06**	**.08**	**.02**	**.14**	**.14**	.00

Note. PRS = Performance Rating Scales. *R* = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Consistent with expectations and previous analyses, the TAPAS composites (Can-Do, Will-Do, and Adaptation) evidenced no notable increments over the AFQT in predicting scores on the composite measure of Knowledge and Skill ($\Delta R < .01$). Similarly, the TAPAS composites did not show incremental validity in the prediction of the other Can Do criteria, namely WTBD JKT and the Can Do Performance composite (ΔRs $< .01$). These results are not surprising given that the AFQT is an established strong predictor of Can Do outcomes.

Figures 5.1 and 5.2 provide results of the combined Tier 1 and 2 analyses examining the incremental validity of criteria-specific TAPAS scales over and above the AFQT for Will Do and Can Do criteria, respectively. Note that the results shown in these figures reflect regression models that used individual TAPAS scales as predictors (as opposed to the TAPAS composites). Similar to the results of the TAPAS composite models discussed previously, the Will-Do scales provided the largest gains over the AFQT. Increases in *R* were largest for the Will Do Performance composite, APFT Score, Army Life Adjustment, Commitment and Fit, and Army Fit (ΔRs $\geq .10$). Results of the Can-Do TAPAS scales showed no notable increments over the AFQT in predicting the Can Do criteria.

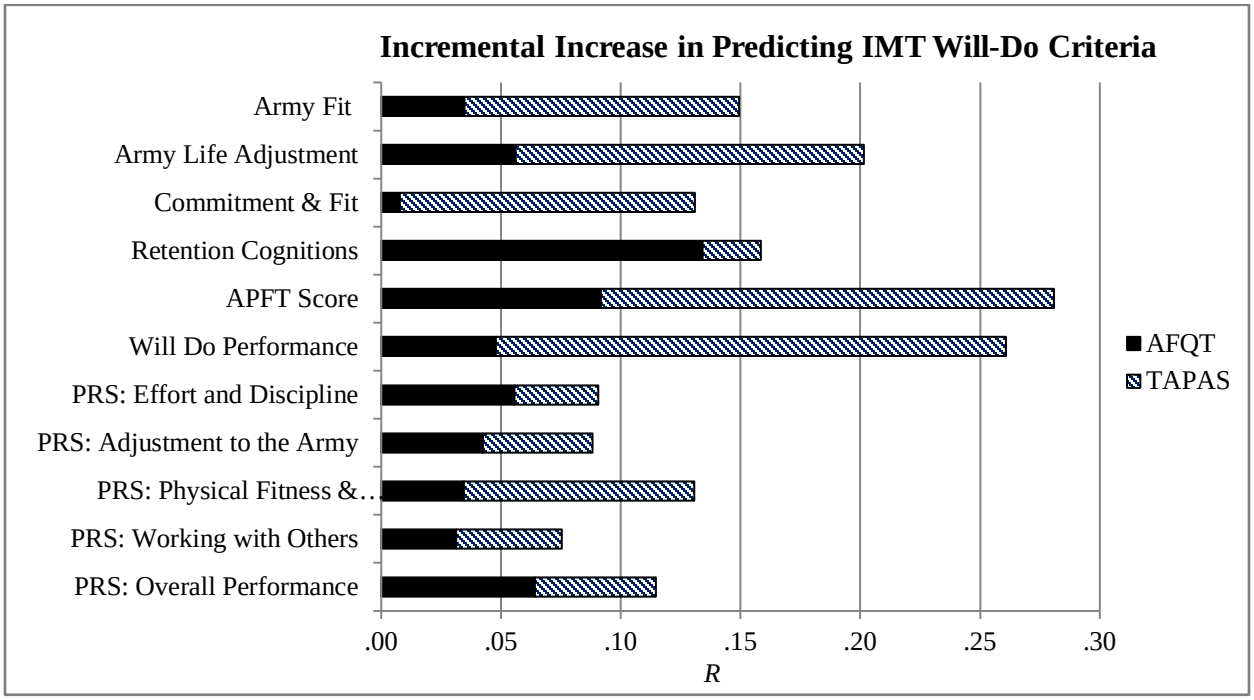


Figure 5.1. Increase in prediction of IMT criteria using Will-Do TAPAS scales for the combined Tier 1 and 2 sample.

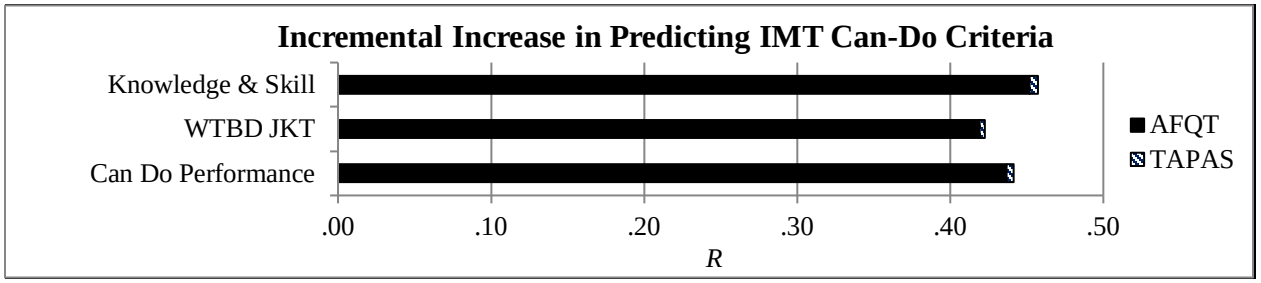


Figure 5.2. Increase in prediction of IMT criteria using Can-Do TAPAS scales for the combined Tier 1 and 2 sample.

Predicting In-Unit Performance

The incremental validity results for predicting in-unit performance are presented in Tables 5.5 to 5.7. Similar to the results for the IMT performance criteria, these results also suggest that the TAPAS composites are useful predictors of in-unit performance outcomes. For multiple outcomes, the Will-Do and Adaptation TAPAS composites both exhibited enhanced prediction beyond the AFQT alone. Results for which predictive gains (i.e., Δ*R*s) were greater than .05 are detailed below.

For motivation-based criteria, the Will-Do composite showed increases beyond the AFQT in predicting the APFT Score (Δ*R* = .21) and PRS: Physical Fitness and Bearing (Δ*R* = .10). With respect to analyses in predicting the Can Do outcomes of Knowledge and Skill or WTBD JKT scores, none of the TAPAS composite predictors demonstrated meaningful incremental validity beyond the AFQT in the prediction of Knowledge and Skill or WTBD JKT scores (Δ*R*s ≤ .01). Although the Can-Do and Adaptation composites showed statistically significant increases beyond the AFQT, these effects are very near 0 and negligible.

The TAPAS Adaptation composite also demonstrated incremental validity for predicting the APFT Score (Δ*R* = .14) and PRS: Physical Fitness and Bearing (Δ*R* = .06) in the combined sample. Similar to the analyses of the IMT criteria, the Can-Do composite did not provide incremental validity in the prediction of any in-unit criteria. However, this result is expected given that the Can-Do composite is not intended to be related to Will Do outcomes, and the AFQT is an established strong predictor of Can Do outcomes.

Table 5.5. Incremental Validity Estimates for the TAPAS over AFQT for Predicting In-Unit Technical Performance Criteria by Education Tier

In-Unit Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
Knowledge & Skill	*n = 4,338 - 6,459*			*n = 4,211 - 6,275*			*n = 127 - 184*		
Can-Do [a]	**.44**	**.45**	**.00**	**.44**	**.45**	**.00**	**.45**	**.46**	.01
Will-Do	**.45**	**.45**	.00	**.45**	**.45**	.00	**.48**	**.48**	.00
Adaptation	**.45**	**.45**	**.00**	**.45**	**.45**	**.00**	**.48**	**.48**	.00
WTBD JKT	*n = 4,332 - 6,452*			*n = 4,205 - 6,268*			*n = 127 - 184*		
Can-Do [a]	**.44**	**.44**	**.01**	**.44**	**.44**	**.01**	**.43**	**.43**	.01
Will-Do	**.44**	**.44**	.00	**.44**	**.44**	.00	**.44**	**.44**	.00
Adaptation	**.44**	**.44**	**.00**	**.44**	**.44**	**.00**	**.44**	**.45**	.00

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. *R* = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Table 5.6. Incremental Validity Estimates for the TAPAS over AFQT for Predicting In-Unit Adjustment, Commitment & Fit, Fitness, and Retention Criteria by Education Tier

In-Unit Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
Army Fit	*n = 4,424 - 6,574*			*n = 4,292 - 6,384*			*n = 132 - 190*		
Can-Do [a]	**.04**	**.05**	.01	**.05**	**.05**	.01	.07	.08	.01
Will-Do	**.03**	**.08**	**.05**	**.04**	**.08**	**.04**	.10	.11	.00
Adaptation	**.03**	**.04**	**.01**	**.04**	**.04**	**.01**	.10	.11	.00
MOS Fit	*n = 4,424 - 6,574*			*n = 4,292 - 6,384*			*n = 132 - 190*		
Can-Do [a]	.02	.03	.01	.02	.03	.01	.03	.07	.04
Will-Do	**.03**	**.05**	**.03**	**.03**	**.05**	**.03**	.05	.08	.03
Adaptation	**.03**	**.06**	**.03**	**.03**	**.05**	**.03**	.05	.15	**.10**
Commitment & Fit	*n = 4,424 - 6,574*			*n = 4,292 - 6,384*			*n = 132 - 190*		
Can-Do [a]	**.03**	**.04**	.00	**.04**	**.04**	.00	.06	.06	.00
Will-Do	.02	**.07**	**.05**	**.03**	**.07**	**.05**	.09	.10	.02
Adaptation	.02	**.04**	**.02**	**.03**	**.04**	**.02**	.09	.11	.02
Retention Cognitions	*n = 4,424 - 6,574*			*n = 4,292 - 6,384*			*n = 132 - 190*		
Can-Do [a]	**.13**	**.13**	.00	**.13**	**.13**	.00	.01	.06	.04
Will-Do	**.13**	**.13**	.00	**.13**	**.13**	.00	.01	.01	.00
Adaptation	**.13**	**.13**	**.00**	**.13**	**.14**	**.00**	.01	.02	.02
APFT Score	*n = 4,219 - 6,296*			*n = 4,093 - 6,114*			*n = 126 - 182*		
Can-Do [a]	.02	.02	.00	.02	.02	.00	.12	.12	.00
Will-Do	.02	**.22**	**.21**	.02	**.22**	**.21**	.03	.18	**.15**
Adaptation	.02	**.16**	**.14**	.02	**.16**	**.14**	.03	.12	.08

Note. R = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Table 5.7. Incremental Validity Estimates for the TAPAS over AFQT for Predicting In-Unit Performance Rating Criteria by Education Tier

In-Unit Criterion Measure / Model	Tier 1 + 2 (Combined)			Tier 1			Tier 2		
	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*	AFQT *R*	AFQT + TAPAS *R*	Δ*R*
PRS: Effort and Discipline	*n = 3,505 - 5,270*			*n = 3,403 - 5,122*			*n = 102 - 148*		
Can-Do [a]	**.09**	**.09**	.00	**.08**	**.08**	.00	.16	.18	.01
Will-Do	**.09**	**.11**	**.02**	**.09**	**.10**	**.02**	**.21**	**.22**	.01
Adaptation	**.09**	**.10**	**.00**	**.09**	**.09**	.00	**.21**	**.23**	.02
PRS: Working with Others	*n = 3,507 - 5,272*			*n = 3,405 - 5,124*			*n = 102 - 148*		
Can-Do [a]	**.11**	**.11**	.00	**.11**	**.11**	.00	.12	.18	.06
Will-Do	**.12**	**.14**	**.02**	**.12**	**.14**	**.02**	**.19**	**.22**	.03
Adaptation	**.12**	**.12**	**.00**	**.12**	**.12**	.00	**.19**	**.26**	**.07**
PRS: Physical Fitness and Bearing	*n = 3,526 - 5,293*			*n = 3,424 - 5,145*			*n = 102 - 148*		
Can-Do [a]	.01	.02	.01	.02	.02	.01	.09	.15	.06
Will-Do	.01	**.11**	**.10**	.02	**.11**	**.10**	.02	.14	.12
Adaptation	.01	**.08**	**.06**	.02	**.08**	**.06**	.02	.14	.12
PRS: Leadership Potential	*n = 3,453 - 5,193*			*n = 3,352 - 5,046*			*n = 101 - 147*		
Can-Do [a]	**.07**	**.07**	.00	**.07**	**.07**	.00	.14	.17	.02
Will-Do	**.07**	**.11**	**.04**	**.07**	**.11**	**.04**	**.20**	**.22**	.02
Adaptation	**.07**	**.08**	**.01**	**.07**	**.08**	**.01**	**.20**	**.23**	.03
PRS: Overall Performance	*n = 3,502 - 5,263*			*n = 3,400 - 5,115*			*n = 102 - 148*		
Can-Do [a]	**.08**	**.08**	.00	**.08**	**.08**	.00	.06	.15	.09
Will-Do	**.09**	**.12**	**.03**	**.09**	**.12**	**.03**	.15	.18	.03
Adaptation	**.09**	**.10**	**.01**	**.09**	**.10**	**.01**	.15	.19	.04

Note. PRS = Performance Rating Scales. *R* = multiple correlations between the AFQT and selected TAPAS composite scales with the targeted criterion measure. Δ*R* = Increment in *R* from adding the selected TAPAS composite scale to the regression model [(AFQT + TAPAS) – AFQT Only]. Bolded values indicate $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

The results of the combined Tier 1 and 2 incremental validity analyses for criterion-specific TAPAS scales are shown in Figures 5.3 and 5.4 for Will Do and Can Do criteria, respectively. Similar to the results of the TAPAS composite models predicting both IMT and in-unit criteria, the Will-Do scales provided the largest gains over the AFQT. Increases in *R* were largest for the APFT Score and PRS: Physical Fitness and Bearing (ΔRs $\geq$ .10). Results of the model including the Can-Do TAPAS scales exhibited negligible increments beyond AFQT in predicting either Knowledge and Skill or the WTBD JKT.

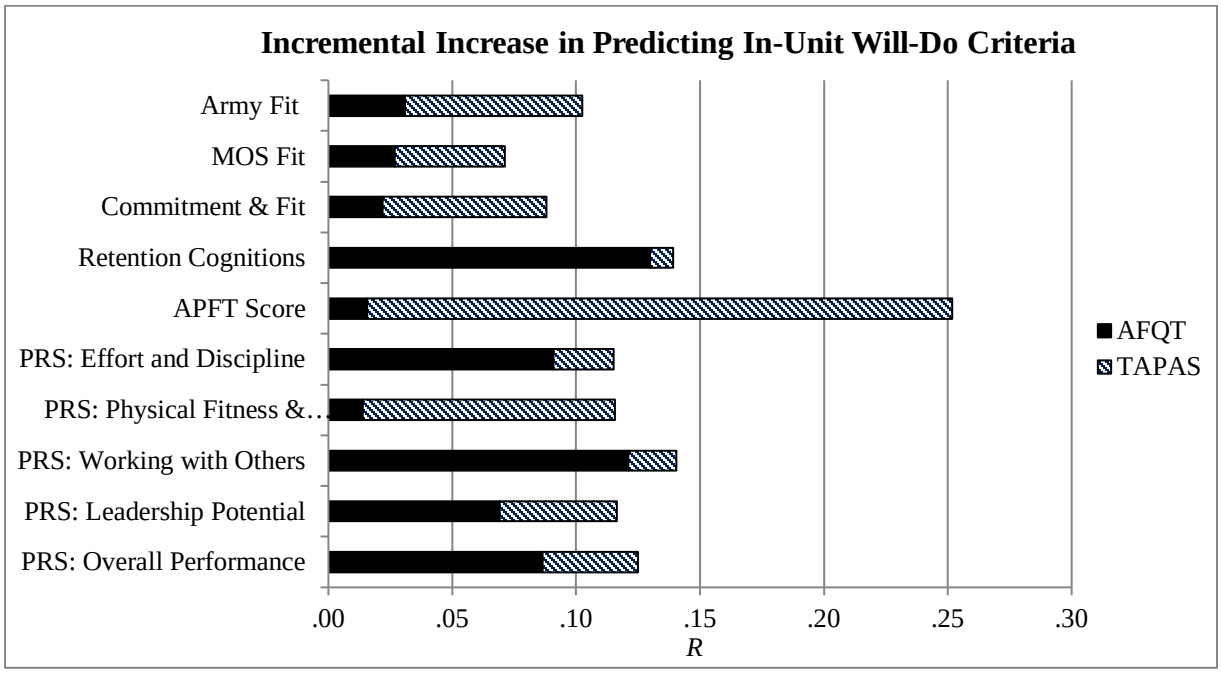


Figure 5.3. Increase in prediction of in-unit criteria using Will-Do TAPAS scales for the combined Tier 1 and 2 sample.

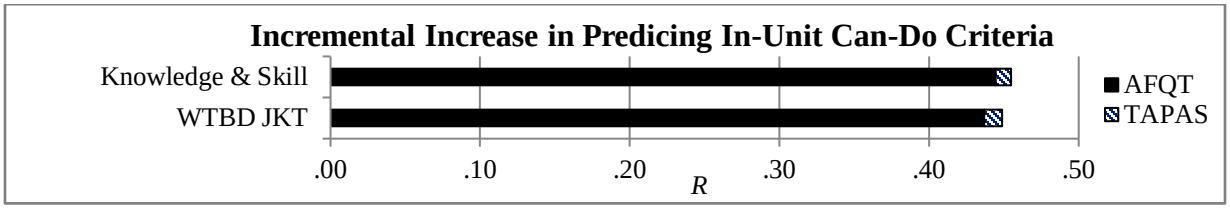


Figure 5.4. Increase in prediction of in-unit criteria using Can-Do TAPAS scales for the combined Tier 1 and 2 sample.

Predicting Dichotomous Outcomes

In addition to the OLS regression analyses of IMT and in-unit criteria, we conducted logistic regression analyses of the dichotomous outcomes, including Disciplinary Incidents (both IMT and In-Unit), IMT Restarts, and attrition at 6, 12, and 24 months. For these models, we estimated odds ratios (ORs) for the predictors as well as the corresponding confidence intervals (CIs). Additionally, we computed point biserial correlations (r_{pb}) and conducted χ^2 tests of the change in model deviance (i.e., negative two log likelihood; -2LL) from the AFQT-only to the AFQT + TAPAS composite models.

Odds ratios can be used to assess the likelihood (or odds) of a given outcome depending on change in a predictor. Specifically, for a given logistic regression model, a unique odds ratio is estimated for each predictor, and represents the amount of change in the odds of the outcome that is associated with change in the given predictor. For the present analyses, the ORs represent the amount of change in the likelihood of each outcome that can be attributed to every 1.0 change in the predictor score. Note that ORs equal to 1.0 reflect no relationship between a given predictor and outcome, ORs greater than 1.0 reflect positive relationships, and ORs between 0.0 and less than 1.0 reflect negative relationships (i.e., decreasing odds of the outcome with increasing values of the predictor). For ORs below 1.0, values closer to 0.0 indicate stronger negative relationships. Although values of ORs cannot fall below 0.0, there is no upper limit for ORs (Cohen, Cohen, West, & Aiken, 2003). In addition, we computed 95% CIs for the ORs, which can be interpreted as an index of statistical significance for each. That is, a CI that contains 1.0 suggests that the relationship between the associated predictor and outcome is not significant.

Point biserial correlations represent the correlation between a Soldier's predicted probability of exhibiting a selected behavior and his or her actual behavior (e.g., being involved in a disciplinary incident; Tabachnick & Fidell, 2013). As such, stronger point biserial correlations reflect stronger relationships between predicted and observed outcomes, and thus are indicative of better-fitting models. Model deviance (i.e., -2LL) also provides an index of model fit. Moreover, the difference in deviances obtained from nested logistic regression models can be tested using likelihood ratio χ^2 tests to determine the statistical significance of change in model fit between models. In the present application, statistically significant likelihood ratio χ^2 tests of the change in deviances suggest that the inclusion of a given TAPAS composite to a regression model provides significantly better prediction of the outcome than the AFQT alone.

Results of the analyses examining Disciplinary Incidents (IMT and in-unit) and IMT Restarts are provided in Table 5.8. For the combined Tier 1 and 2 sample, both the Will-Do and Adaptation TAPAS composites enhanced the prediction of IMT Disciplinary Incidents and IMT Restarts beyond the AFQT-only models. Specifically, for both Disciplinary Incidents ($OR_{Will\text{-}Do}$ = .987; $OR_{Adaptation}$ = .992) and IMT Restarts ($OR_{Will\text{-}Do}$ = .994; $OR_{Adaptation}$ = .995), ORs associated with both composites were below 1.0, indicating that as scores on these composites went up, the likelihood of the outcome went down. Similarly for in-unit Disciplinary Incidents, both the Will-Do and Adaptation composites had significant relationships ($OR_{Will\text{-}Do}$ = .992; $OR_{Adaptation}$ = .996) and resulted in better model fit over the AFQT alone. The Can-Do composite did not predict either IMT or in-unit Disciplinary Incidents (as evidenced by CIs that include 1.000 for the associated ORs). Furthermore, the addition of the Can-Do composite to the AFQT-only model did not lead to an improvement in fit for models predicting Disciplinary Incidents (IMT and in-unit) or IMT Restarts.

Table 5.9 presents the results of the logistic regression analyses examining attrition through 6, 12, and 24 months of service for Regular Army. The Will-Do ($.990 \leq OR_{Will\text{-}Do} \leq .992$) and Adaptation ($.990 \leq OR_{Adaptation} \leq .991$) composites were negatively related to attrition at all three time points, and their respective inclusion in the models resulted in significantly better fit over the AFQT alone. Conversely, the TAPAS Can-Do composite was positively related to attrition at each of the time points for Regular Army Soldiers ($OR_{Can\text{-}Do} > 1.00$). However, the OR lower bounds of the CIs for the Can-Do composite were very near 1.0 in each of the attrition models, and these results may not represent a true effect.

Table 5.8. Incremental Validity Estimates for the TAPAS Composites over AFQT for Predicting Dichotomous Criteria by Education Tier

Criterion Measure / Model	Tier 1 + 2 (Combined)				Tier 1				Tier 2			
	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL
IMT Disciplinary Incidents	*n = 28,036 - 37,132*				*n = 27,034 - 35,812*				*n = 1,002 - 1,320*			
Can-Do [a]												
AFQT	.924 (.898-.950)		.03		.922 (.897-.949)		.03		.975 (.819-1.162)		.01	
AFQT+TAPAS	.931 (.903-.959)	.999 (.998-1.000)	.03	1.83	.930 (.903-.959)	.999 (.997-1.000)	.03	2.24	.961 (.799-1.156)	1.002 (.994-1.010)	.02	0.24
Will-Do												
AFQT	.932 (.910-.955)		.03		.931 (.908-.954)		.03		.983 (.846-1.142)		.01	
AFQT + TAPAS	.954 (.931-.978)	.987 (.986-.988)	.11	**447.75**	.953 (.930-.977)	.987 (.986-.988)	.11	**428.95**	.987 (.849-1.147)	.986 (.980-.993)	.12	**17.51**
Adaptation												
AFQT	.932 (.910-.955)		.03		.931 (.908-.954)		.03		.983 (.846-1.142)		.01	
AFQT + TAPAS	.958 (.935-.982)	.992 (.991-.993)	.07	**161.46**	.958 (.935-.982)	.992 (.991-.993)	.07	**165.18**	.985 (.847-1.146)	.999 (.993-1.006)	.01	0.07
IMT Restarts	*n = 329,273 - 455,906*				*n = 316,285 - 438,474*				*n = 12,988 - 17,432*			
Can-Do [a]												
AFQT	.988 (.973-1.004)		.00		.987 (.972-1.003)		.00		1.034 (.948-1.128)		.01	
AFQT+TAPAS	.991 (.974-1.007)	1.000 (.999-1.000)	.00	0.62	.990 (.973-1.007)	1.000 (.999-1.000)	.00	0.81	1.041 (.951-1.140)	.999 (.995-1.003)	.01	0.26
Will-Do												
AFQT	.989 (.976-1.002)		.00		.988 (.974-1.001)		.00		1.054 (.978-1.135)		.01	
AFQT + TAPAS	.998 (.985-1.012)	.994 (.993-.995)	.03	**299.73**	.997 (.984-1.011)	.994 (.993-.995)	.03	**300.53**	1.054 (.978-1.135)	.997 (.994-1.001)	.02	2.56
Adaptation												
AFQT	.989 (.976-1.002)		.00		.988 (.974-1.001)		.00		1.054 (.978-1.135)		.01	
AFQT + TAPAS	1.005 (.992-1.019)	.995 (.994-.996)	.02	**223.29**	1.004 (.990-1.017)	.995 (.994-.995)	.02	**223.30**	1.058 (.982-1.140)	.998 (.994-1.001)	.01	1.87

Table 5.8. (Continued)

Criterion Measure / Model	Tier 1 + 2 (Combined)				Tier 1				Tier 2			
	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL
In-Unit Disciplinary Incidents	*n = 4,424 - 6,572*				*n = 4,292 - 6,382*				*n = 132 - 190*			
Can-Do [a]												
AFQT	.891 (.830-.956)		.05		.893 (.832-.959)		.05		.799 (.498-1.282)		.09	
AFQT+TAPAS	.906 (.840-.979)	.998 (.994-1.002)	.05	1.27	.909 (.841-.982)	.998 (.994-1.002)	.05	1.24	.815 (.495-1.342)	.998 (.978-1.018)	.09	0.06
Will-Do												
AFQT	.889 (.839-.942)		.05		.888 (.838-.942)		.05		.856 (.583-1.258)		.06	
AFQT + TAPAS	.891 (.841-.944)	.992 (.990-.995)	.08	**26.46**	.890 (.839-.944)	.992 (.989-.995)	.08	**27.74**	.857 (.583-1.259)	1.001 (.985-1.018)	.06	0.02
Adaptation												
AFQT	.889 (.839-.942)		.05		.888 (.838-.942)		.05		.856 (.583-1.258)		.06	
AFQT + TAPAS	.899 (.848-.954)	.996 (.993-.999)	.06	**8.53**	.899 (.848-.954)	.996 (.993-.998)	.06	**8.94**	.853 (.580-1.255)	1.002 (.985-1.019)	.06	0.05

Note. OR = odds ratio for each predictor. CI = 95% confidence interval of the odds ratio. r_{pb} = point biserial correlation between the observed outcome and predicted probability. Δ-2LL = change in negative two log likelihood (deviance) from adding the selected TAPAS composite score to the AFQT-only logistic regression model. Odds ratios equal to 1.0 (or confidence intervals of the odds ratio that include 1.0) indicate no relationship between the predictor and criterion. Odds ratios less than 1.0 indicate a negative relationship between the predictor and criterion. Odds ratios greater than 1.0 indicate a positive relationship between the predictor and criterion. For Δ-2LL, bolded values indicate significant change in model fit based on a Likelihood Ratio χ^2 test, $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

[b] The point biserial correlation could not be computed because there was no variance in predicted values for Tier 2 IMT Disciplinary Incidents for this sample.

Table 5.9. Incremental Validity Estimates for the TAPAS Composite Scores over AFQT for Predicting Cumulative Attrition through 24 Months of Service by Education Tier (Regular Army Only)

Attrition Measure / Model	Tier 1 + 2 (Combined)				Tier 1				Tier 2			
	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL
6 Month	*n = 148,319 - 216,372*				*n = 142,974 - 209,283*				*n = 5,345 - 7,089*			
Can-Do [a]												
AFQT	.814 (.800-.828)		.06		.805 (.791-.820)		.06		.974 (.884-1.074)		.01	
AFQT+TAPAS	.803 (.788-.819)	1.002 (1.001-1.003)	.06	**12.53**	.796 (.781-.812)	1.001 (1.000-1.002)	.06	**8.85**	.960 (.867-1.062)	1.002 (.998-1.006)	.02	1.04
Will-Do												
AFQT	.818 (.806-.830)		.06		.811 (.799-.823)		.06		.927 (.852-1.009)		.02	
AFQT + TAPAS	.826 (.815-.839)	.990 (.989-.991)	.08	**750.04**	.820 (.808-.832)	.990 (.989-.991)	.08	**741.16**	.923 (.848-1.005)	.994 (.990-.997)	.05	**13.76**
Adaptation												
AFQT	.818 (.806-.830)		.06		.811 (.799-.823)		.06		.927 (.852-1.009)		.02	
AFQT + TAPAS	.839 (.827-.852)	.991 (.990-.992)	.08	**606.08**	.833 (.821-.845)	.991 (.990-.992)	.08	**610.88**	.932 (.856-1.015)	.997 (.993-1.000)	.03	3.56
12 Month	*n = 124,391 - 191,856*				*n = 119,828 - 185,576*				*n = 4,563 - 6,280*			
Can-Do [a]												
AFQT	.842 (.828-.856)		.05		.834 (.820-.849)		.06		1.009 (.919-1.108)		.00	
AFQT+TAPAS	.833 (.818-.849)	1.001 (1.000-1.002)	.05	**8.30**	.827 (.812-.843)	1.001 (1.000-1.002)	.06	**4.88**	.994 (.901-1.096)	1.002 (.998-1.006)	.02	1.07
Will-Do												
AFQT	.850 (.838-.861)		.05		.843 (.832-.855)		.05		.956 (.882-1.035)		.01	
AFQT + TAPAS	.858 (.846-.870)	.990 (.989-.990)	.09	**887.69**	.852 (.840-.864)	.989 (.989-.990)	.09	**883.57**	.952 (.878-1.031)	.994 (.991-.998)	.04	**11.52**
Adaptation												
AFQT	.850 (.838-.861)		.05		.843 (.832-.855)		.05		.956 (.882-1.035)		.01	
AFQT + TAPAS	.873 (.861-.885)	.990 (.990-.991)	.08	**743.64**	.867 (.855-.879)	.990 (.990-.991)	.08	**746.37**	.963 (.888-1.043)	.996 (.993-.999)	.03	**5.95**

Table 5.9. (Continued)

Attrition Measure / Model	Tier 1 + 2 (Combined)				Tier 1				Tier 2			
	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL	OR_{AFQT} (CI)	OR_{TAPAS} (CI)	r_{pb}	Δ-2LL
24 Month	*n = 88,111 - 151,449*				*n = 85,021 - 146,843*				*n = 3,090 - 4,606*			
Can-Do [a]												
AFQT	.822 (.808-.836)		.07		.816 (.802-.830)		.08		.930 (.839-1.031)		.02	
AFQT+TAPAS	.816 (.800-.831)	1.001 (1.000-1.002)	.07	**4.05**	.811 (.796-.827)	1.001 (1.000-1.002)	.08	1.96	.921 (.826-1.027)	1.001 (.997-1.005)	.03	0.33
Will-Do												
AFQT	.830 (.820-.841)		.07		.826 (.815-.837)		.07		.879 (.807-.957)		.04	
AFQT + TAPAS	.838 (.827-.849)	.992 (.991-.992)	.09	**614.39**	.833 (.822-.844)	.991 (.991-.992)	.10	**615.07**	.876 (.805-.955)	.996 (.993-.999)	.05	**5.17**
Adaptation												
AFQT	.830 (.820-.841)		.07		.826 (.815-.837)		.07		.879 (.807-.957)		.04	
AFQT + TAPAS	.851 (.840-.862)	.991 (.991-.992)	.10	**670.08**	.846 (.835-.858)	.991 (.990-.992)	.10	**678.03**	.884 (.811-.963)	.997 (.994-1.000)	.05	2.95

Note. OR = odds ratio for each predictor. CI = 95% confidence interval of the odds ratio. r_{pb} = point biserial correlation between the observed outcome and predicted probability. Δ-2LL = change in negative two log likelihood (deviance) from adding the selected TAPAS composite score to the AFQT-only logistic regression model. Odds ratios equal to 1.0 (or confidence intervals of the odds ratio that include 1.0) indicate no relationship between the predictor and criterion. Odds ratios less than 1.0 indicate a negative relationship between the predictor and criterion. Odds ratios greater than 1.0 indicate a positive relationship between the predictor and criterion. For Δ-2LL, bolded values indicate significant change in model fit based on a Likelihood Ratio χ^2 test, $p < .05$.

[a] Because the Can-Do composite is based on a subset of the data, these results may underestimate its incremental validity.

Figures 5.5 and 5.6 display the accuracy of the logistic regression models in predicting the dichotomous outcomes (Disciplinary Incidents, IMT Restarts, and attrition) for the combined Tier 1 and 2 sample. For each outcome, results are presented for three models which include the following predictors: (a) AFQT, (b) TAPAS composite, and (c) AFQT + TAPAS composite. Specifically, the *percent accurate* values represent the *c* statistic, or area under the receiver operating characteristic (ROC) curve, which reflects the ability of the given model to correctly discriminate between a case and a noncase (e.g., attriter vs. stayer). [12] The area under the curve (AUC) can range from .50 to 1.0, corresponding to 50% (or chance) and 100% accuracy, respectively. For example, the closer AUC is to 1.0, the more likely it is that Soldiers with at least one IMT Disciplinary Incident will have lower TAPAS scores than Soldiers without any incidents.

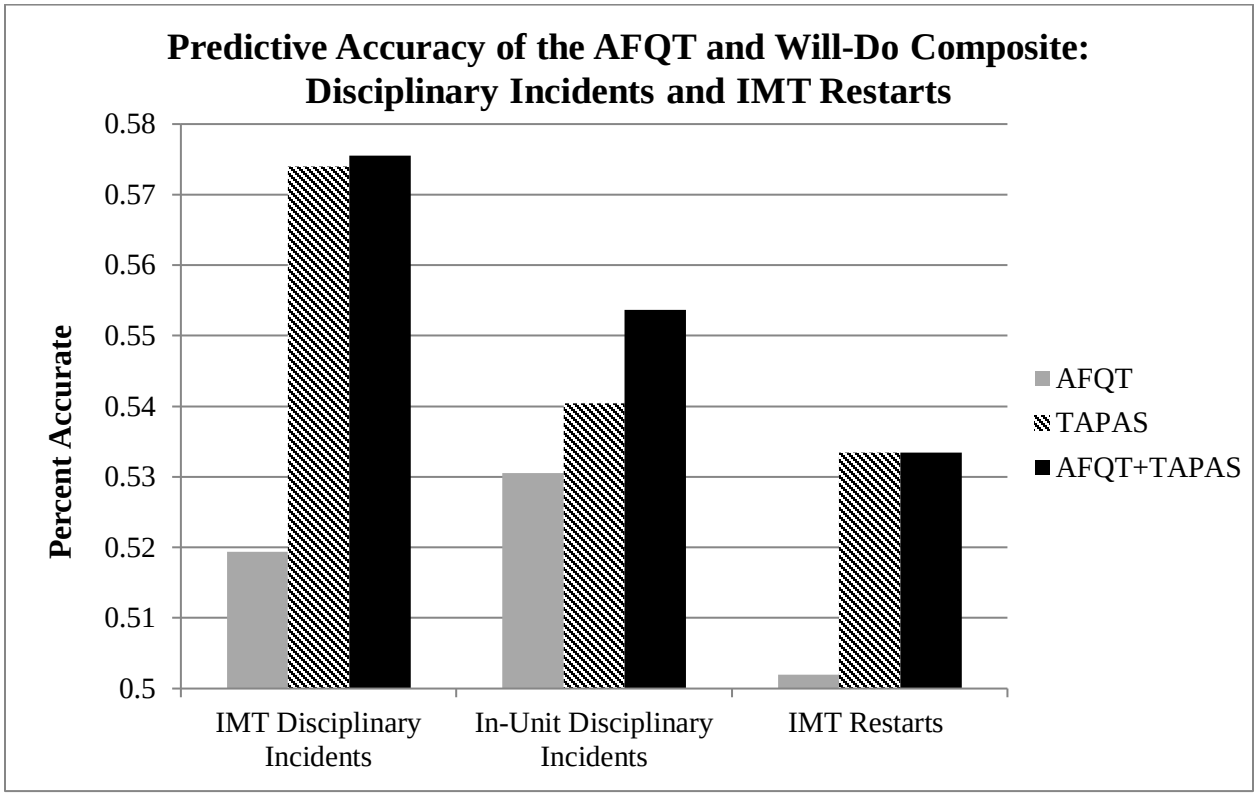


Figure 5.5. Predictive accuracy of the AFQT and Will-Do TAPAS composite in the discrimination of both IMT and In-Unit Disciplinary Incidents and IMT Restarts for the combined Tier 1 and 2 sample.

In particular, Figure 5.5 displays the results of the AFQT and Will-Do TAPAS composite models in predicting Disciplinary Incidents (IMT and in-unit) and IMT Restarts. For all three criteria, the probability of discriminating between Soldiers with and without incidence of the outcome of interest is lowest (less than 53.1%) when using the AFQT alone. However, the predictive accuracy increases

[12] The ROC curve is a plot of sensitivity (i.e., probability of detecting a true positive) versus specificity (i.e., probability of detecting a true negative) across a range of potential cut scores for continuous predictors in a logistic regression model (Cook, 2007). For the purposes of evaluating the logistic regression models discussed in this report, only the area under the ROC curve (i.e., AUC) is presented and discussed.

for the Will-Do composite and AFQT + Will-Do composite models for all outcomes. Note the combined model demonstrated the most accuracy, ranging from 57.6% for IMT Disciplinary Incidents to 53.3% for IMT Restarts. In addition, the increase in discrimination accuracy for the combined model compared to the Will-Do composite-only model was generally small, suggesting that the AFQT adds little value to the discrimination of these dichotomous outcomes.

Figure 5.6 displays the results of the AFQT and Adaptation TAPAS composite models in predicting attrition for Regular Army Soldiers. For 6-, 12-, and 24-month attrition, the combined AFQT + Adaptation composite model resulted in the highest discrimination accuracy (approximately 57% for each time point). When comparing the AFQT-only and Adaptation composite-only models, the Adaptation composite-only model evidenced higher accuracy than the AFQT-only at each time point. For each time point, the accuracy of the combined model improved by at least 1% over either predictor alone, suggesting that both the AFQT and Adaptation TAPAS composite contribute to the prediction of attrition.

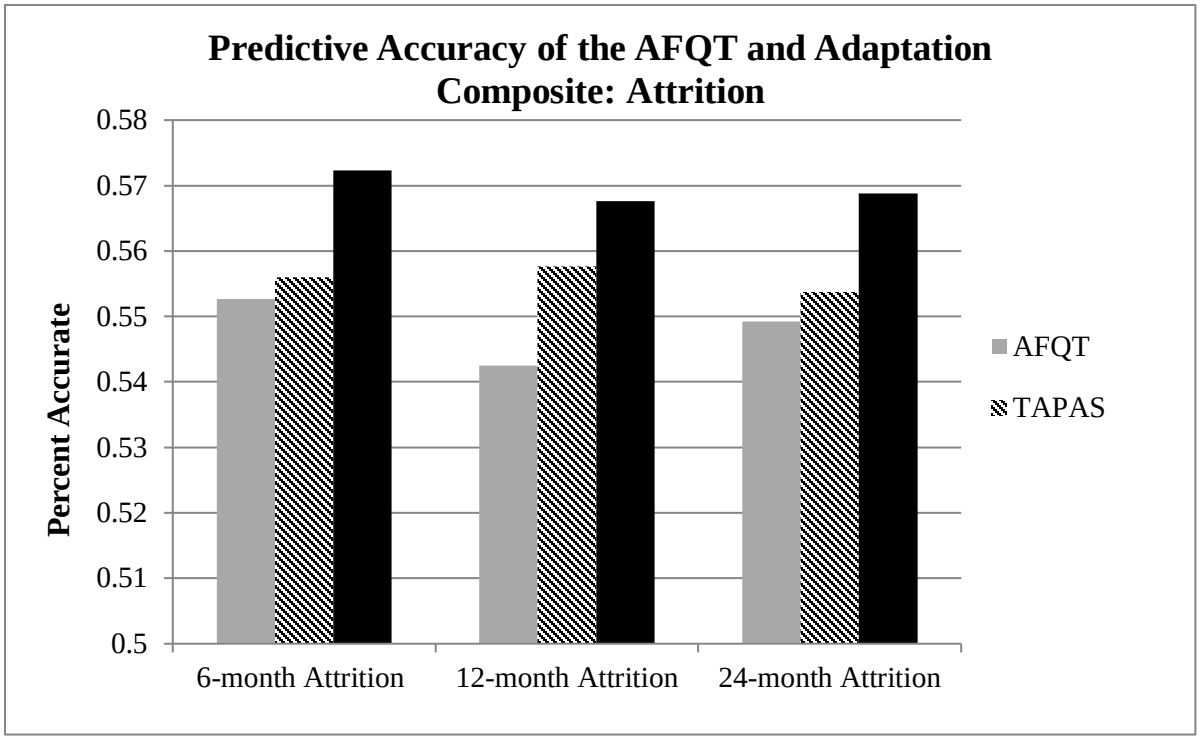


Figure 5.6. Predictive accuracy of the AFQT and Adaptation TAPAS composite in the discrimination of attrition outcomes for Regular Army Soldiers in the combined Tier 1 and 2 sample.

Additional analyses have begun examining the relationship of the TAPAS with Soldier reenlistment. Appendix E presents some of the initial results from this new line of research. Specifically, Table E-1 presents the results of logistic regression analyses that examined the relationships between individual TAPAS scales and reenlistment after Soldiers' first terms of service. Results include model fit statistics and ORs representing the effects of the TAPAS scales on reenlistment. These analyses were conducted both across and within a number of specific

MOS. Additional work to examine prediction of reenlistment behavior will be conducted in future evaluation cycles.

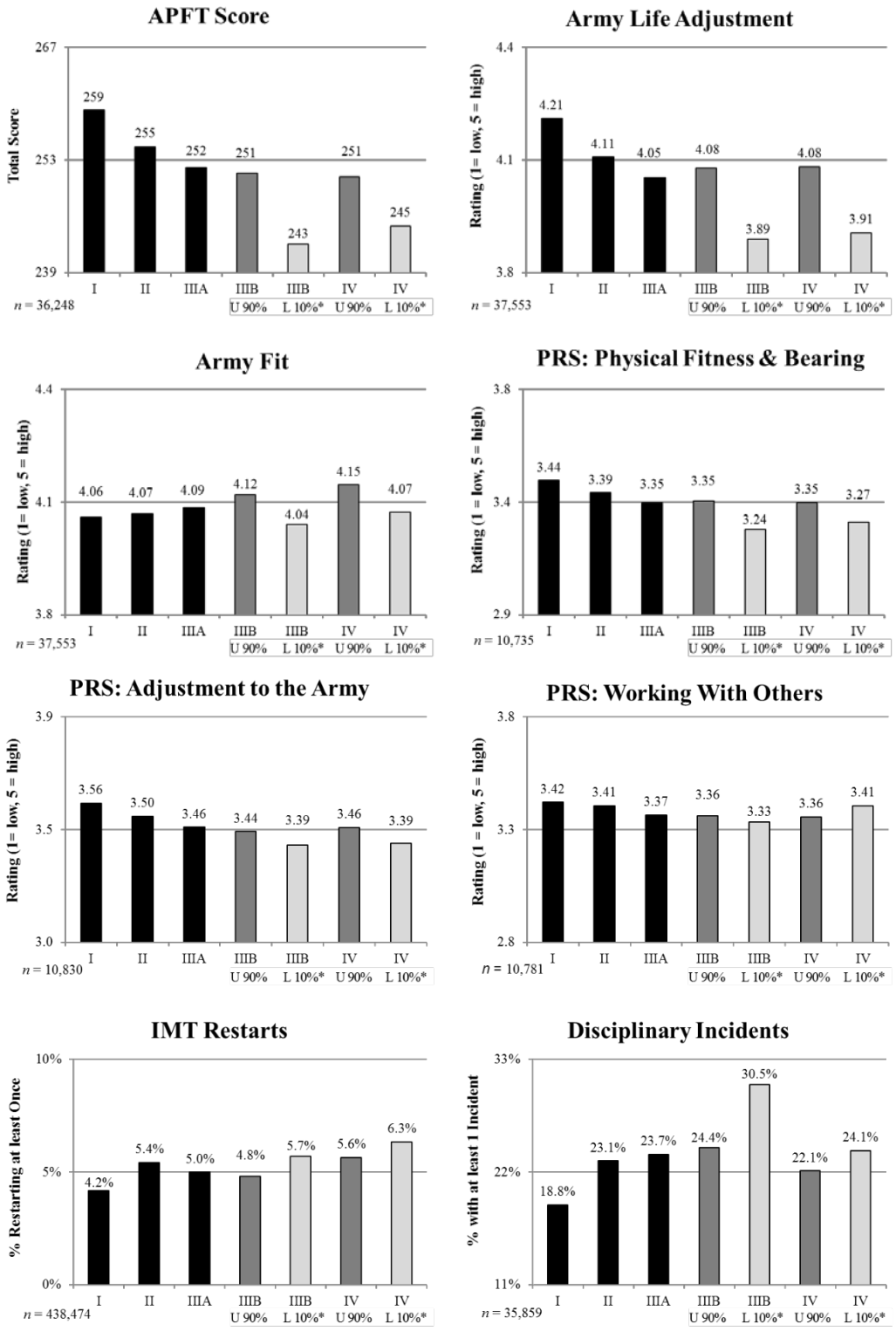
TAPAS Performance Categories

To further examine the relationships between the TAPAS and the various IMT, in-unit, and attrition criteria, we conducted analyses that assessed these criteria with respect to AFQT categories and TAPAS score percentiles. Army applicants are classified into AFQT categories based on their performance on the AFQT (described in Chapter 2). For these analyses, Tier 1 Soldiers with AFQT scores falling in Categories IIIB or IV were split at the 10th percentile into two groups based on their TAPAS Will-Do and TAPAS Adaptation composite scores: Upper 90% and Lowest 10%. For Tier 2 Soldiers in AFQT Categories I through IV, Soldiers were split by their TAPAS Will-Do composite scores into either an upper 70% and lowest 30% group. Army applicants in AFQT Category V are screened out regardless of TAPAS scores, so they do not appear in our analysis sample.

The following analyses examine scores on key outcomes for (a) Tier 1 Soldiers from each AFQT category as well as (b) Tier 2 Soldiers relative to Tier 1 Soldiers. In general, the results highlight the performance differences between Soldiers who score highest on the TAPAS compared to those who score the lowest.

Specifically, we computed Soldiers' IMT mean scores for APFT, Army Life Adjustment, Army Fit, PRS: Physical Fitness and Bearing, PRS: Adjustment to the Army, and PRS: Working with Others by AFQT categories. In addition, we computed proportions of Soldier attrition and frequencies for IMT Restarts, Disciplinary Incidents, and attrition at 6, 12, and 24 months by AFQT category. The results for IMT criteria by AFQT categories for Tier 1 Soldiers are presented in Figure 5.7.

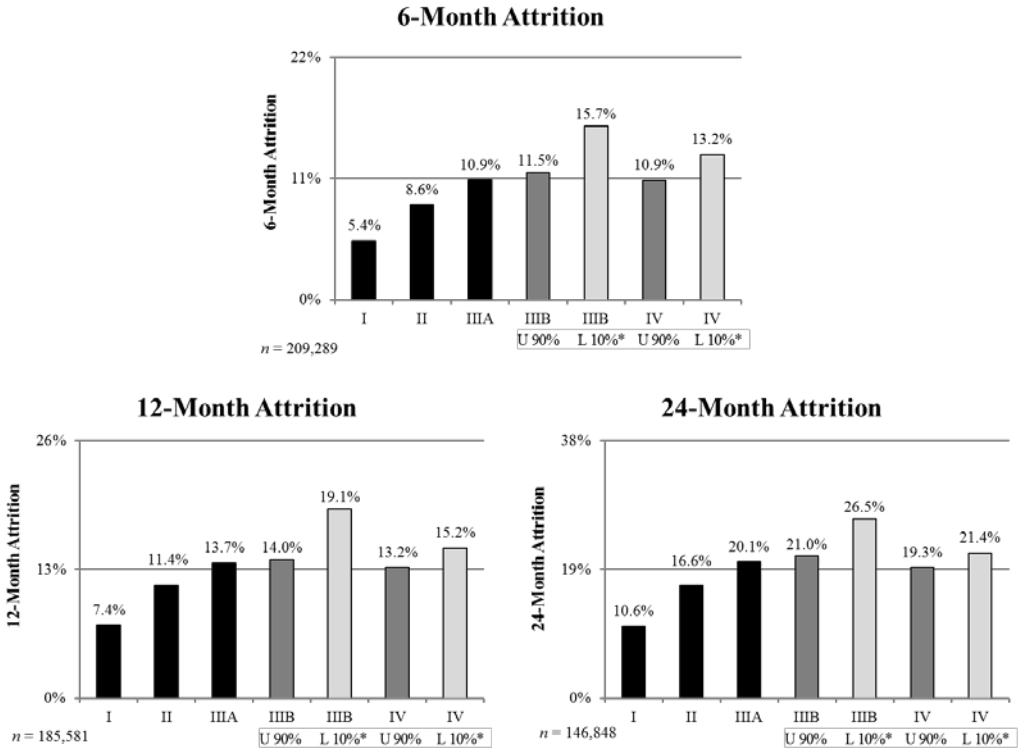
As expected, Figure 5.7 demonstrates that Soldiers scoring higher on the AFQT generally receive more favorable scores on the IMT criteria with the exceptions of Army Fit and IMT Restarts. Importantly, these graphs also highlight a clear distinction for Soldiers in AFQT Categories IIIB and IV based on their TAPAS scores. For every criterion, Soldiers in the IIIB and IV categories who scored among the upper 90% on the TAPAS had better outcomes than Soldiers in the corresponding lowest 10% group. For example, average APFT Score for IIIB and IV TAPAS Soldiers were 8 and 6 points higher, respectively, for the upper 90% group compared to the lowest 10% group. Army Life Adjustment and Disciplinary Incidents were also markedly better for IIIB and IV Soldiers scoring above the 10th percentile on the TAPAS. Moreover, these Soldiers had better outcomes than IIIA Soldiers on some criterion measures, including Army Life Adjustment and Army Fit, and scored just as well as IIIA Soldiers on PRS: Physical Fitness and Bearing. Soldiers in AFQT Category IV who scored among the upper 90% on the TAPAS also had fewer Disciplinary Incidents than those who scored among the lowest 10% as well as Category II, IIIA, and IIIB Soldiers. Note that Soldiers scoring among the lowest on the AFQT and TAPAS have been screened out and are therefore excluded from these analyses. As such, these effects are likely attenuated with respect to differences between the categories.



Note. U 90% = Upper 90% TAPAS Will-Do and Adaptation composite scores. L 10% = Lowest 10% TAPAS Will-Do and Adaptation composite scores. * = Lowest scoring cognitive ability/TAPAS applicants screened out. Sample sizes vary based on avaliability of the outcome data.

Figure 5.7. Tier 1 Soldier outcomes for selected IMT criteria by AFQT category and TAPAS score.

Similar trends are visible when examining attrition outcomes as shown in Figure 5.8. Attrition for Tier 1 Soldiers in the IIIB and IV lowest 10% TAPAS groups was greater than attrition for Soldiers in the IIIB and IV upper 90% TAPAS groups at each of the time points. For Soldiers in Category IIIB, this difference ranged from 4.2% at 6 months to 5.5% at 24 months. Differences were smaller for Soldiers in Category IV, and ranged from 2.0% at 12 months to 2.3% at 6 months.

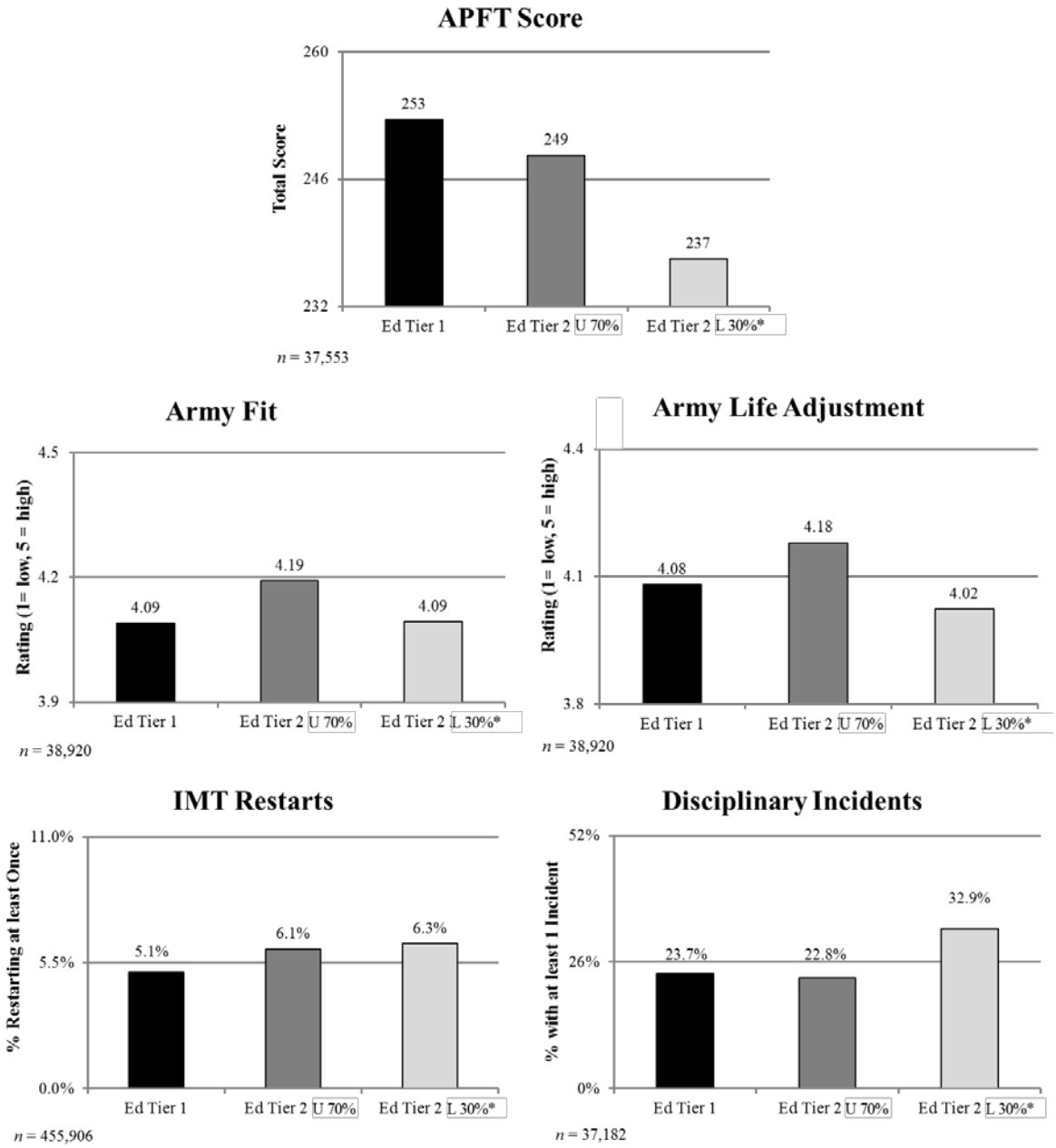


Note. U 90% = Upper 90% TAPAS Will-Do and Adaptation composite scores. L 10% = Lowest 10% TAPAS Will-Do and Adaptation composite scores. * = Lowest scoring cognitive ability/TAPAS applicants screened out. Sample sizes vary based on avaliability of attrition data.

Figure 5.8. Tier 1 Soldier attrition by AFQT category and TAPAS score.

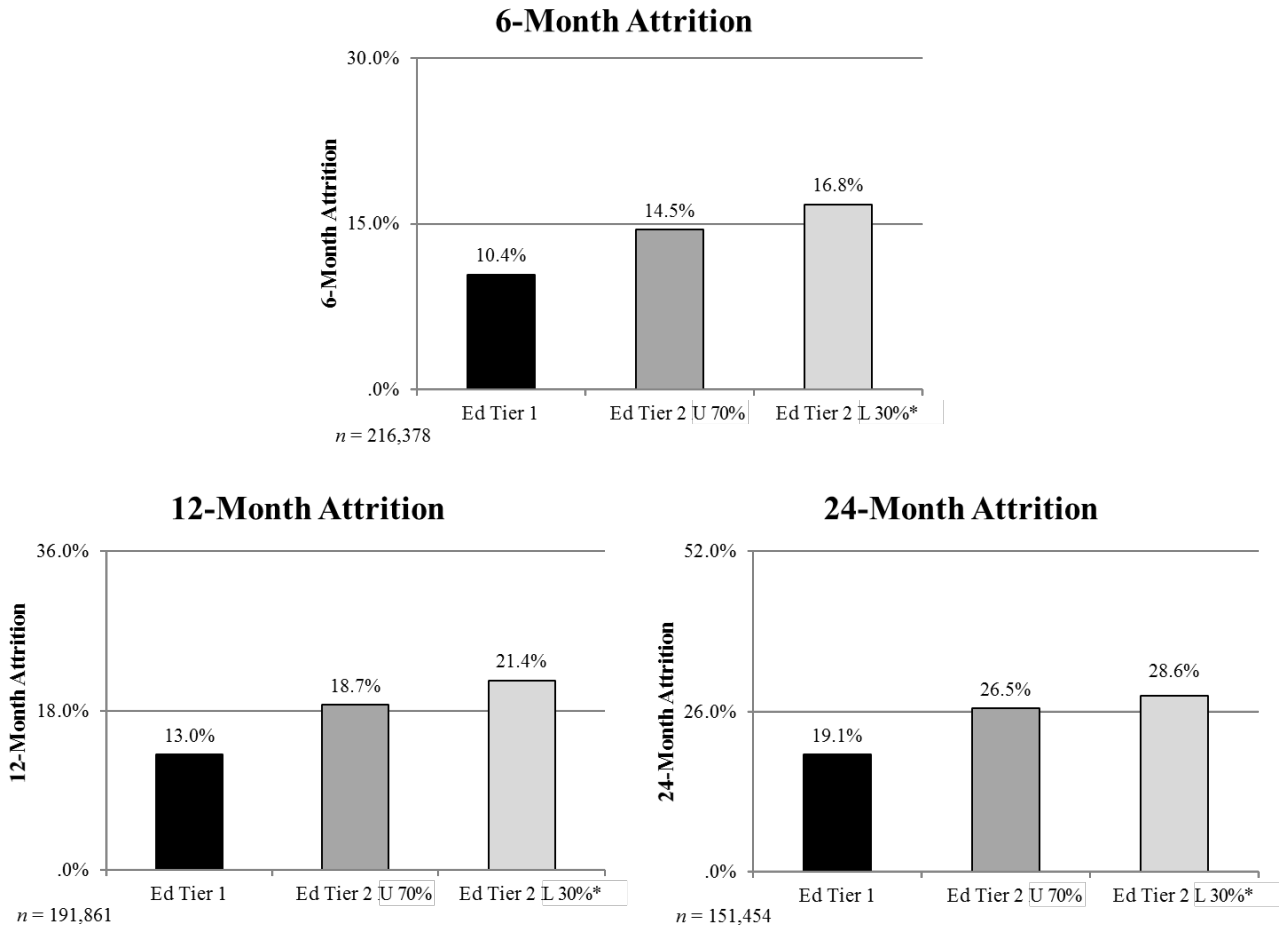
Figure 5.9 compares selected IMT criteria for Tier 2 and Tier 1 Soldiers. As previously stated, Tier 2 Soldiers were split at the 30th percentile for these analyses. For each outcome, Tier 2 Soldiers in the upper 70% TAPAS group had more favorable outcomes than Tier 2 Soldiers in the lowest 30% group. For example, average APFT scores were 12 points higher for the Tier 2 upper 70% group than lowest 30% group, and 10.1% more lowest 30% Tier 2 Soldiers had at least one Disciplinary Incident compared to the upper 70% Tier 2 Soldiers. In addition, Tier 2 Soldiers in the upper 70% TAPAS group had more favorable outcomes with respect to Army Fit and Army Life Adjustment than Tier 1 Soldiers, and slightly fewer Disciplinary Incidents on average.

As shown in Figure 5.10, Tier 2 Soldiers in the upper 70% TAPAS group also had lower attrition rates than those in the lower 30% group at 6, 12, and 24 months. These differences ranged from 2.1% lower attrition at 24 months to 2.7% at 12 months. Attrition for Tier 1 relative to Tier 2 Soldiers was lower at all three time points.



Note. U 70% = Upper 70% TAPAS Will-Do composite scores. L 30% = Lowest 30% TAPAS Will-Do composite scores. * = Lowest scoring TAPAS applicants screened out. Sample sizes vary based on avaliability of outcome data.

Figure 5.9. Comparison of Tier 2 Soldier TAPAS performance category with Tier 1 Soldiers on selected IMT outcomes.



Note. U 70% = Upper 70% TAPAS Will-Do composite scores. L 30% = Lowest 30% TAPAS Will-Do composite scores. * = Lowest scoring TAPAS applicants screened out. Sample sizes vary based on avaliability of outcome data.

Figure 5.10. Comparison of Tier 2 Soldier TAPAS performance category with Tier 1 Soldiers on attrition outcomes.

For the in-unit criteria of WTBD JKT, APFT Score, Army Fit, and PRS: Leadership Potential, we computed Soldiers' mean performance scores by quintiles based on TAPAS percentile scores. Figure 5.11 presents the relationship between TAPAS scores and these selected in-unit criteria for Tier 1 Soldiers only. In general, Soldiers with higher TAPAS scores also had better performance outcomes. For each outcome, Soldiers who scored in the top 20th percentile on the TAPAS were also the highest performers. Moreover, Soldiers scoring in the bottom 20th percentile on the TAPAS performed lowest as a group for every outcome examined, with particularly notable differences between Soldiers in the top and bottom TAPAS percentiles on WTBD JKT and APFT Score.

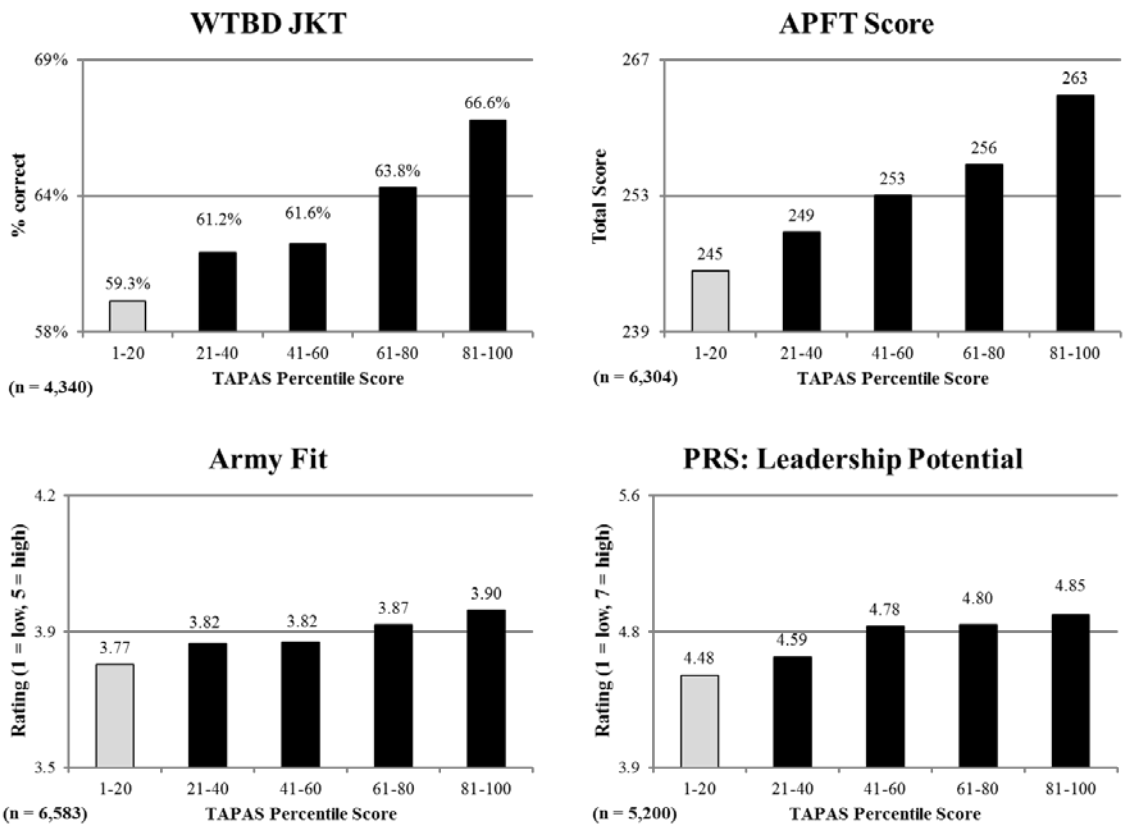


Figure 5.11. Tier 1 Soldier outcomes for selected in-unit criteria by TAPAS percentile score categories.

Summary

This chapter summarized results from the 14th cycle of the evaluation of criterion-related validity in the TOPS IOT&E. Overall, the TAPAS composites demonstrated incremental validity over the AFQT in predicting first-term Soldier performance and retention. In particular, the TAPAS Will-Do composite demonstrated the greatest incremental validity overall, with ΔR estimates for eight IMT and four in-unit criteria meeting or exceeding .05. The TAPAS Adaptation composite also yielded incremental validity estimates above .05 for three IMT criteria and two in-unit criteria. In addition, both the Will-Do and Adaptation composites demonstrated negative relationships with the dichotomous criteria (i.e., attrition, disciplinary incidents, and IMT restarts). Higher scores on these composites were associated with a reduction in the likelihood of these outcomes. Conversely, the TAPAS Can-Do composite did not provide any notable incremental validity for the criteria examined here. This finding is not surprising given the established strength of the AFQT in the prediction of cognitively-based criteria. Furthermore, results of the analyses by TAPAS performance categories provide support for the utility of TAPAS. For both IMT and attrition criteria, AFQT Category IIIB and IV Soldiers scoring among the upper 90% on the TAPAS Will-Do composite have markedly better outcomes than those Category IIIB/IV Soldiers scoring among the bottom 10%, and they often possess scores in line with AFQT Category IIIA Soldiers. Additionally, in-unit criterion scores are consistently lowest for Tier 1 Soldiers whose TAPAS scores are among the bottom 20th percentile.

CHAPTER 6: SUMMARY AND A LOOK AHEAD

Deirdre J. Knapp (HumRRO), Cristina D. Kirkendall, and Heather M.K. Wolters (ARI)

Summary of the TOPS IOT&E Method

In an effort to expand the basis on which applicants are evaluated for enlistment, the Army is conducting an initial operational test and evaluation (IOT&E) of the *Tier One Performance Screen (TOPS)*. The TOPS assessment, the Tailored Adaptive Personality Assessment System (TAPAS), is being administered to non-prior service applicants testing at all MEPS locations.

To evaluate the TAPAS, the Army is collecting criterion data on Soldiers at multiple points during their time in service. Some outcome data are available from administrative records, including training course grades, training completion rates, and separation status. Data on additional measures are collected from Soldiers in selected MOS as they complete IMT. These measures include job knowledge tests (JKTs), an attitudinal person-environment fit assessment (the Army Life Questionnaire; ALQ), and performance rating scales (PRS) completed by the Soldiers' cadre members. Versions of the JKTs and the ALQ suited for Soldiers in their first enlistment term are also administered to Soldiers after they have joined their units. Performance ratings are collected from their supervisors at this time as well. Analysis datasets incorporating TAPAS and criterion data are constructed and cumulative validation analyses are being conducted at 6-month intervals throughout the IOT&E period.

The latest analysis data file (December 2016) includes almost one million (915,578) applicants who have taken the TAPAS since 2009. Of these, 846,400 are in the TOPS Applicant Sample. The Applicant Sample was determined by excluding Education Tier 3, AFQT Category V, and prior service applicants from the master data file. Of that Applicant Sample, 480,138 (56.7%) have a record in at least one of the administrative criterion data sources; 43,647 (5.2%) have IMT data collected from the schoolhouse and 7,228 (.85%) have in-unit criterion data.

Data from the JKTs, PRS, ALQ, and administrative sources were combined to yield an array of scores representing important Soldier outcomes. In general, the criterion scores exhibit acceptable psychometric properties and a sensible pattern of intercorrelations. The exception to this is the Army-wide and MOS-specific PRS, which continue to exhibit low interrater reliability.

Summary of Evaluation Results to Date

Evaluation results suggest that the TAPAS holds promise for new Soldier selection. Results of the incremental validity analyses indicate that the TAPAS predicts important first-term criteria over and above the AFQT, especially measures tapping motivation-based aspects of Soldier performance, such as Commitment and Fit, Army Life Adjustment, and Army Fit, and Physical Fitness and Bearing. Further, examination of AFQT categories and quintile splits of predictor composites show a clear improvement in favor of higher scoring individuals. Individuals in the lowest category performed the worst. These findings are consistent with past evaluations in this

series (Bynum & Mullins, 2017; Knapp & Heffner, 2011, 2012; Knapp et al., 2011; Knapp & LaPort, 2013a, 2013b, 2014) and the original research that led Army policy-makers to select TAPAS for the TOPS IOT&E (Knapp & Heffner, 2010).

The Will-Do composite was associated with the greatest incremental validity gains compared to other TAPAS composites. This was especially true for the prediction of Will Do Performance Army Physical Fitness Test scores, and Commitment and Fit. When examining outcomes by AFQT category, a clear distinction was seen when contrasting the lowest scoring (10^{th} percentile and below) AFQT Category IIIB and IV Soldiers with those scoring higher on the TAPAS. For a number of outcomes, including Disciplinary Incidents, IMT Restarts, and attrition, more favorable outcomes were observed for the higher scoring groups. The Adaptation composite generally provided small incremental validity gains in attrition, with Adaptation showing larger gains for higher months in service. Even these small gains in validity are important, particularly given the modest relationship with the AFQT. Results showed consistently higher attrition among the lowest scoring Category IIIB and IV Soldiers.

Looking Ahead

Changes to Predictor Measures

In September of 2013, a third series of new adaptive forms of the TAPAS were introduced at the MEPS. Each form measures 13 dimensions. Each of the three new forms assesses the same 10 core dimensions, plus three of seven experimental dimensions. The seven experimental dimensions assessed vary by version. In total, the newer versions of the TAPAS collectively measure 17 dimensions. The experimental dimensions will be evaluated for potential use in revised or new TAPAS composites, once sufficient data are available.

Changes to Criterion Measures

The IMT performance rating scales have been problematic for some time, in part because they have exhibited low reliability, but also because it is burdensome for IMT cadre to complete the ratings. In addition, IMT classes are often so large that the cadre completing the PRS are overwhelmed with the number of Soldiers they are asked to rate and are rarely familiar with all of their ratees. Collecting performance ratings from peers is a strategy that could provide a different perspective on Soldier performance and potentially more reliable data since it would be more feasible to gather data from multiple raters per Soldier. Therefore, ARI has developed peer versions of the Army-wide PRS that were introduced into criterion data collections in both IMT and in-unit starting in December 2016. To reduce burden on operations, collection of cadre ratings was suspended in May 2017. Supervisor ratings of Soldiers in-unit will continue. Future TOPS reports will include information on the psychometric properties of the peer PRS after a sufficient amount of data is collected.

The IMT and in-unit versions of the ALQ have been revised to reduce redundancy and make room for addition of new outcomes of interest to the Army. New topics cover content related to organizational citizenship behaviors, counterproductive work behaviors, work-life balance, deployment satisfaction, reasons for choosing to join the Army/specific MOS, resilience, and

leadership. After pilot testing with Soldiers outside the TOPS sample, the new ALQs were introduced into the criterion data collections in May 2017.

Analyses

The semi-annual cycle of analyses will continue to evaluate basic psychometric properties of the assessments, validation, and incremental validation analyses. Given the fairly significant changes that are being made to the criterion measures, the project team will be considering strategies for identifying sub-samples of the full database for certain validation analyses. Additional analyses may include evaluation of the experimental TAPAS facets for potential use in revised or new TAPAS composites, or an alternative approach for modeling MOS classification outcomes. We will continue to update or to modify our evaluation analysis plans as the Army's goals for the TOPS IOT&E evolve or to better meet the informational needs of Army stakeholders.

Related Research

ARI is conducting research to examine the test-retest reliability of the TAPAS. Research to determine TAPAS' prediction potential for MOS assignment continues (e.g., Nye et al., 2012). Temperament measures as well as interest inventories predicted attrition and job attitudes for a subset of MOS included in the TOPS research (Ingerick et al., 2009; Knapp et al., 2012). Ongoing research continues to examine the utility of TAPAS and a similarly designed vocational interest measure (the Adaptive Vocational Interest Diagnostic [AVID]) as an assignment tool.

Conclusion

Inclusion of non-cognitive measures in initial entry screening allows the Army to predict a broader range of valued Army outcomes than traditional cognitive ability measures and educational credential screening. The TAPAS test, specifically, demonstrates the ability to predict an expanded concept of Soldier performance to include motivation, disciplinary behavior, adaptability, adjustment to military life, and attrition. Indeed, the TAPAS predicts these outcomes over and above the AFQT. Thus, TAPAS provides unique and valuable information regarding a recruit's potential success as a Soldier that is not captured elsewhere in the accession process. Additional research should continue to refine and expand the prediction potential of TAPAS and other non-cognitive measures.

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APPENDIX A

PREDICTOR MEASURE PSYCHOMETRIC PROPERTIES IN THE APPLICANT SAMPLE

Table A.1. Mean and Standard Deviations for the TAPAS Composites and TAPAS Scales on the 15-Dimension Forms (June 2009-September 2013)

	15D-Static/CAT v4/5/7/8					
	Tier 1+ 2 (Combined) (n = 100,555-419,789)		Tier 1 (n = 94,957-398,102)		Tier 2 (n = 5,556-21,687)	
TAPAS Composite/ TAPAS Scale	*M*	*SD*	*M*	*SD*	*M*	*SD*
Individual TAPAS Scales [a]						
Achievement	-0.01	0.98	-0.01	0.98	0.06	0.98
Adjustment	-0.02	0.98	-0.03	0.98	0.12	0.97
Adventure Seeking	-0.06	0.98	-0.06	0.98	0.01	0.98
Attention Seeking	-0.04	0.98	-0.04	0.98	-0.02	1.00
Commitment to Serve	0.00	0.98	-0.01	0.98	0.20	0.95
Cooperation	0.01	0.98	0.02	0.98	-0.02	0.98
Courage	-0.02	0.98	-0.03	0.98	0.14	0.97
Dominance	-0.02	0.98	-0.02	0.98	-0.08	1.00
Even Tempered	0.01	0.98	0.00	0.98	0.14	0.99
Intellectual Efficiency	-0.02	0.97	-0.02	0.98	0.09	0.95
Non-Delinquency	0.03	0.98	0.04	0.98	-0.06	1.02
Optimism	0.00	0.98	0.00	0.98	-0.01	0.98
Order	0.01	0.98	0.01	0.98	0.00	0.96
Physical Conditioning	0.01	0.98	0.02	0.98	-0.17	0.95
Responsibility	0.00	0.98	-0.01	0.98	0.06	0.99
Self-Control	0.00	0.98	0.00	0.98	0.12	0.99
Selflessness	0.01	0.98	0.01	0.98	-0.01	0.99
Situational Awareness	-0.02	0.98	-0.03	0.98	0.13	0.98
Sociability	-0.01	0.98	-0.01	0.98	-0.02	0.99
Team Orientation	-0.01	0.99	-0.01	0.99	-0.01	1.04
Tolerance	0.00	0.98	-0.01	0.98	0.04	0.97
TAPAS Composites						
Can-Do	99.79	20.93	99.70	20.97	101.58	20.10
Will-Do	99.92	19.16	100.03	19.18	97.90	18.73
Adaptation	100.19	19.57	100.27	19.60	98.58	18.91

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data.

[a] Sample sizes vary as a result of TAPAS scales not being administered in every version.

Table A.2. Mean and Standard Deviations for the TAPAS Composites and TAPAS Scales on 13D-CAT-v9 (September 2013-September 2016)

TAPAS Composite/ TAPAS Scale	13D-CAT v9					
	Tier 1+ 2 (Combined) (n = 133,121)		Tier 1 (n = 126,441)		Tier 2 (n = 6,680)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Individual TAPAS Scales [a]						
Achievement	0.01	0.99	0.00	0.99	0.17	0.98
Adjustment	--	--	--	--	--	--
Adventure Seeking	--	--	--	--	--	--
Attention Seeking	--	--	--	--	--	--
Commitment to Serve	-0.02	0.98	-0.03	0.99	0.21	0.91
Cooperation	0.02	0.99	0.02	0.99	0.03	0.99
Courage	--	--	--	--	--	--
Dominance	0.01	0.98	0.00	0.98	0.03	1.00
Even Tempered	0.05	1.01	0.04	1.01	0.31	1.01
Intellectual Efficiency	0.04	0.97	0.03	0.97	0.21	0.94
Non-Delinquency	--	--	--	--	--	--
Optimism	0.02	0.99	0.02	0.99	0.06	1.00
Order	-0.02	0.97	-0.02	0.97	-0.05	0.97
Physical Conditioning	-0.04	1.01	-0.03	1.01	-0.20	0.98
Responsibility	0.02	0.99	0.01	0.99	0.16	1.00
Self-Control	--	--	--	--	--	--
Selflessness	0.09	1.01	0.09	1.01	0.05	1.05
Situational Awareness	--	--	--	--	--	--
Sociability	0.07	1.02	0.07	1.02	0.23	1.06
Team Orientation	--	--	--	--	--	--
Tolerance	0.10	0.99	0.09	0.99	0.25	1.00
TAPAS Composites						
Can-Do	100.00	19.72	99.87	19.71	102.42	19.65
Will-Do	99.67	20.28	99.69	20.30	99.30	19.96
Adaptation	99.35	20.01	99.42	20.05	98.20	19.35

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data.

[a] Not all TAPAS scales were administered in every version; missing *M* and *SD* indicate that the scale was not administered.

Table A.3. Mean and Standard Deviations for the TAPAS Composites and TAPAS Scales on 13D-CAT-v10 (September 2013-September 2016)

TAPAS Composite/ TAPAS Scale	13D-CAT v10					
	Tier 1+ 2 (Combined) (n = 132,613)		Tier 1 (n = 126,005)		Tier 2 (n = 6,608)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Individual TAPAS Scales [a]						
Achievement	-0.02	0.98	-0.03	0.98	0.16	0.97
Adjustment	--	--	--	--	--	--
Adventure Seeking	--	--	--	--	--	--
Attention Seeking	--	--	--	--	--	--
Commitment to Serve	--	--	--	--	--	--
Cooperation	--	--	--	--	--	--
Courage	0.01	1.00	0.00	1.00	0.27	0.96
Dominance	-0.03	0.98	-0.04	0.98	-0.01	0.99
Even Tempered	0.02	1.01	0.00	1.01	0.30	1.02
Intellectual Efficiency	0.01	0.95	0.00	0.95	0.18	0.91
Non-Delinquency	0.03	0.98	0.03	0.98	0.12	1.05
Optimism	0.02	0.98	0.02	0.98	0.05	0.99
Order	-0.03	0.98	-0.03	0.98	-0.07	0.98
Physical Conditioning	-0.04	0.99	-0.03	0.99	-0.20	0.95
Responsibility	--	--	--	--	--	--
Self-Control	--	--	--	--	--	--
Selflessness	0.10	0.99	0.10	0.99	0.07	1.03
Situational Awareness	-0.06	0.99	-0.07	0.99	0.18	0.98
Sociability	0.08	1.03	0.07	1.02	0.24	1.07
Team Orientation	--	--	--	--	--	--
Tolerance	0.10	0.99	0.09	0.99	0.24	1.01
TAPAS Composites						
Can-Do	99.37	19.65	99.23	19.66	102.06	19.35
Will-Do	99.27	19.66	99.28	19.69	99.10	19.15
Adaptation	99.25	19.85	99.30	19.89	98.31	19.15

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data.

[a] Not all TAPAS scales were administered in every version; missing *M* and *SD* indicate that the scale was not administered.

Table A.4. Mean and Standard Deviations for the TAPAS Composites and TAPAS Scales on 13D-CAT-v11 (September 2013-September 2016)

TAPAS Composite/ TAPAS Scale	13D-CAT v11					
	Tier 1+ 2 (Combined) (n = 134,184)		Tier 1 (n = 127,589)		Tier 2 (n = 6,595)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Individual TAPAS Scales [a]						
Achievement	0.01	0.99	0.00	0.99	0.17	0.99
Adjustment	--	--	--	--	--	--
Adventure Seeking	--	--	--	--	--	--
Attention Seeking	0.03	0.99	0.03	0.98	0.16	1.04
Commitment to Serve	0.00	1.00	-0.01	1.00	0.25	0.94
Cooperation	--	--	--	--	--	--
Courage	--	--	--	--	--	--
Dominance	-0.01	1.00	-0.01	1.00	0.01	1.03
Even Tempered	0.06	1.01	0.04	1.01	0.30	1.04
Intellectual Efficiency	0.05	0.96	0.04	0.96	0.21	0.94
Non-Delinquency	--	--	--	--	--	--
Optimism	0.02	0.99	0.01	0.99	0.07	1.01
Order	-0.01	0.98	-0.01	0.98	-0.03	0.98
Physical Conditioning	-0.01	1.01	0.00	1.01	-0.17	0.97
Responsibility	--	--	--	--	--	--
Self-Control	--	--	--	--	--	--
Selflessness	0.06	1.00	0.06	1.00	0.02	1.04
Situational Awareness	--	--	--	--	--	--
Sociability	0.06	1.01	0.05	1.00	0.18	1.05
Team Orientation	0.07	1.02	0.06	1.01	0.20	1.09
Tolerance	0.11	0.98	0.10	0.98	0.27	0.98
TAPAS Composites						
Can-Do	100.16	19.62	100.03	19.64	102.73	19.02
Will-Do	99.91	20.37	99.93	20.38	99.60	20.16
Adaptation	99.92	19.85	99.97	19.88	98.86	19.09

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data.

[a] Not all TAPAS scales were administered in every version; missing *M* and *SD* indicate that the scale was not administered.

Table A.5. Correlations between TAPAS Composites and TAPAS Scales with AFQT in the TOPS Applicant Sample by Version

TAPAS Composite/ TAPAS Scale	15D-Static/CAT v4/5/7/8 (June 2009-September 2013)			13D-CAT v9/10/11 (September 2013-September 2016)		
	Tier 1+ 2 (Combined)	Tier 1	Tier 2	Tier 1+ 2 (Combined)	Tier 1	Tier 2
n	100,555-419,789	94,957-398,102	5,556-21,687	132,613-399,918	120,005-380,035	6,595-19,883
Individual TAPAS Scales [a]						
Achievement	**0.06**	**0.06**	**0.02**	**0.04**	**0.04**	**0.04**
Adjustment	**0.12**	**0.12**	**0.11**	--	--	--
Adventure Seeking	**0.10**	**0.10**	**0.06**	--	--	--
Attention Seeking	**0.05**	**0.05**	**0.03**	-0.01	-0.01	0.03
Commitment to Serve	**-0.14**	**-0.14**	**-0.06**	**-0.14**	**-0.14**	**-0.06**
Cooperation	**-0.06**	**-0.06**	**-0.04**	**-0.11**	**-0.11**	**-0.07**
Courage	**0.06**	**0.06**	**0.04**	**0.09**	**0.10**	**0.08**
Dominance	**0.10**	**0.11**	**0.02**	**0.11**	**0.12**	**0.05**
Even Tempered	**0.09**	**0.09**	**0.09**	**0.08**	**0.08**	**0.11**
Intellectual Efficiency	**0.35**	**0.35**	**0.30**	**0.28**	**0.28**	**0.24**
Non-Delinquency	**-0.03**	**-0.04**	-0.01	**-0.05**	**-0.05**	0.00
Optimism	**0.06**	**0.06**	**0.04**	**0.10**	**0.10**	**0.08**
Order	**-0.17**	**-0.17**	**-0.16**	**-0.15**	**-0.15**	**-0.13**
Physical Conditioning	**0.05**	**0.05**	**-0.01**	**0.05**	**0.05**	**-0.03**
Responsibility	**0.15**	**0.15**	**0.09**	**0.14**	**0.14**	**0.12**
Self-Control	**-0.02**	**-0.02**	0.00	--	--	--
Selflessness	**-0.07**	**-0.07**	**-0.08**	**-0.06**	**-0.06**	**-0.08**
Situational Awareness	**0.01**	**0.01**	**0.04**	**0.02**	**0.02**	**0.02**
Sociability	**-0.10**	**-0.10**	**-0.07**	**-0.12**	**-0.12**	**-0.06**
Team Orientation	**-0.10**	**-0.11**	**-0.08**	**-0.07**	**-0.07**	-0.03
Tolerance	**0.03**	**0.03**	**0.03**	**0.08**	**0.08**	**0.09**
TAPAS Composites						
Can-Do	**0.43**	**0.43**	**0.37**	**0.34**	**0.35**	**0.28**
Will-Do	**0.10**	**0.10**	0.01	**0.10**	**0.10**	0.03
Adaptation	**0.17**	**0.17**	**0.11**	**0.18**	**0.19**	**0.11**

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data. Correlations in bold are statistically significant, $p < .01$ (two-tailed).

[a] Not all TAPAS scales were administered in every version; missing *M* and *SD* indicate that the scale was not administered.

Table A.6. Basic Descriptive Statistics for AFQT, ASVAB Subtests, and Aptitude Area (AA) Composites by Version in the TOPS Applicant Sample

	15D-Static/CAT v4/5/7/8 (June 2009-September 2013)					13D-CAT v9/10/11 (September 2013-September 2016)				
Composite/Subtest	*n*	*M*	*SD*	*Min*	*Max*	*n*	*M*	*SD*	*Min*	*Max*
AFQT	419,789	54.51	22.59	10	99	399,918	53.43	22.31	10	99
ASVAB Subtests										
Arithmetic Reasoning (AR)	419,613	51.80	7.63	21	72	399,902	51.34	7.84	19	72
Assembling Objects (AO)	402,589	54.64	7.82	25	70	363,731	54.42	7.94	25	90
Auto & Shop Information (AS)	419,610	48.60	9.21	20	86	399,901	46.40	8.79	19	90
Electronics Information (EI)	419,611	50.94	8.99	15	84	399,902	49.57	9.08	15	90
General Science (GS)	419,613	51.00	8.29	19	76	399,902	50.63	8.39	20	76
Math Knowledge (MK)	419,613	53.24	6.80	25	73	399,902	53.70	6.79	24	80
Mechanical Comprehension (MC)	419,610	52.41	8.33	23	82	399,899	51.30	8.23	23	90
Paragraph Comprehension (PC)	419,613	52.26	6.88	21	69	399,902	51.78	6.85	22	69
Word Knowledge (WK)	419,613	50.51	7.81	16	76	399,902	49.65	7.74	16	80
Aptitude Area (AA) Composites										
Clerical (CL)	419,636	104.35	13.51	50	153	399,898	103.37	13.42	46	154
Combat (CO)	419,636	103.76	14.46	51	160	399,898	102.00	14.20	44	163
Electronics (EL)	419,636	103.49	14.45	52	160	399,898	101.60	14.20	43	163
Field Artillery (FA)	419,636	103.95	14.39	51	160	399,898	102.25	14.15	44	163
General Maintenance (GM)	419,636	103.09	14.94	48	162	399,898	100.99	14.66	44	164
General Technical (GT)	419,640	103.26	13.95	46	149	399,902	101.97	13.86	43	149
Mechanical Maintenance (MM)	419,636	101.85	15.95	46	167	399,898	98.87	15.45	42	168
Operators and Food Service (OF)	419,636	103.04	14.91	50	161	399,898	100.84	14.60	44	164
Surveillance and Communications (SC)	419,636	104.06	14.06	52	159	399,898	102.50	13.87	44	161
Skilled Technical (ST)	419,636	103.92	14.07	51	158	399,898	102.39	13.86	45	160

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data.

Table A.7. Basic Descriptive Statistics for AFQT, ASVAB Subtests, and Aptitude Area (AA) Composites in the 15-Dimension Forms by Education Tier

	Tier 1					Tier 2				
Composite/Subtest	*n*	*M*	*SD*	*Min*	*Max*	*n*	*M*	*SD*	*Min*	*Max*
AFQT	398,102	54.63	22.77	10	99	21,687	52.30	18.74	10	99
ASVAB Subtests										
Arithmetic Reasoning (AR)	397,940	51.83	7.69	21	72	21,673	51.36	6.37	24	72
Assembling Objects (AO)	381,731	54.65	7.83	25	70	20,858	54.42	7.64	26	69
Auto & Shop Information (AS)	397,937	48.45	9.20	20	86	21,673	51.23	8.90	22	82
Electronics Information (EI)	397,938	50.86	9.04	15	84	21,673	52.36	7.94	18	82
General Science (GS)	397,940	50.99	8.35	19	76	21,673	51.13	7.00	20	76
Math Knowledge (MK)	397,940	53.44	6.80	25	73	21,673	49.63	5.52	26	73
Mechanical Comprehension (MC)	397,937	52.37	8.37	23	82	21,673	53.19	7.54	23	79
Paragraph Comprehension (PC)	397,940	52.23	6.92	22	69	21,673	52.75	6.06	21	69
Word Knowledge (WK)	397,940	50.47	7.87	16	76	21,673	51.25	6.61	21	76
Aptitude Area (AA) Composites										
Clerical (CL)	397,955	104.43	13.64	50	153	21,681	102.75	10.69	56	144
Combat (CO)	397,955	103.79	14.59	53	160	21,681	103.22	11.88	51	150
Electronics (EL)	397,955	103.49	14.58	52	160	21,681	103.48	11.82	52	150
Field Artillery (FA)	397,955	103.98	14.51	53	160	21,681	103.33	11.77	51	149
General Maintenance (GM)	397,955	103.07	15.07	51	162	21,681	103.41	12.44	48	152
General Technical (GT)	397,959	103.25	14.08	46	149	21,681	103.52	11.27	54	145
Mechanical Maintenance (MM)	397,955	101.74	16.04	48	167	21,681	103.87	13.97	46	155
Operators and Food Service (OF)	397,955	103.00	15.03	52	161	21,681	103.73	12.43	50	152
Surveillance and Communications (SC)	397,955	104.10	14.19	52	159	21,681	103.23	11.33	54	148
Skilled Technical (ST)	397,955	103.95	14.21	51	158	21,681	103.44	11.33	56	147

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data.

Table A.8. Basic Descriptive Statistics for AFQT, ASVAB Subtests, and Aptitude Area (AA) Composites in Version 9, 10, and 11 by Education Tier

	Tier 1					Tier 2				
Composite/Subtest	*n*	*M*	*SD*	*Min*	*Max*	*n*	*M*	*SD*	*Min*	*Max*
AFQT	380,035	53.50	22.48	10	99	19,883	52.07	18.71	10	99
ASVAB Subtests										
Arithmetic Reasoning (AR)	380,019	51.36	7.90	19	72	19,883	50.93	6.44	23	72
Assembling Objects (AO)	344,716	54.43	7.95	25	90	19,015	54.21	7.80	26	90
Auto & Shop Information (AS)	380,018	46.21	8.75	19	86	19,883	50.05	8.77	24	90
Electronics Information (EI)	380,019	49.47	9.12	15	90	19,883	51.60	8.00	19	81
General Science (GS)	380,019	50.62	8.44	20	76	19,883	50.74	7.17	24	76
Math Knowledge (MK)	380,019	53.91	6.79	24	80	19,883	49.72	5.47	27	80
Mechanical Comprehension (MC)	380,016	51.23	8.26	23	82	19,883	52.50	7.49	25	90
Paragraph Comprehension (PC)	380,019	51.73	6.89	22	69	19,883	52.67	6.01	24	69
Word Knowledge (WK)	380,019	49.57	7.78	16	80	19,883	51.13	6.70	24	80
Aptitude Area (AA) Composites										
Clerical (CL)	380,015	103.43	13.55	46	154	19,883	102.19	10.65	65	148
Combat (CO)	380,015	101.99	14.31	44	163	19,883	102.13	11.79	61	160
Electronics (EL)	380,015	101.56	14.31	43	163	19,883	102.41	11.75	63	155
Field Artillery (FA)	380,015	102.25	14.27	44	163	19,883	102.28	11.69	62	159
General Maintenance (GM)	380,015	100.93	14.77	44	164	19,883	102.12	12.37	61	153
General Technical (GT)	380,019	101.92	13.98	43	149	19,883	102.95	11.30	63	147
Mechanical Maintenance (MM)	380,015	98.70	15.51	42	168	19,883	102.18	13.85	58	166
Operators and Food Service (OF)	380,015	100.75	14.70	44	164	19,883	102.44	12.35	61	156
Surveillance and Communications (SC)	380,015	102.51	13.99	44	161	19,883	102.34	11.25	64	155
Skilled Technical (ST)	380,015	102.38	13.99	45	160	19,883	102.58	11.28	63	154

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data.

Table A.9. Correlations among TAPAS Scale Scores in the Applicant Sample

TAPAS Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Achievement																				
2. Adjustment	**.10**																			
3. Adventure Seeking	**.10**	**.15**																		
4. Attention Seeking	**.04**	**.11**	**.17**																	
5. Commitment to Serve	**.21**	**.05**	**.04**	**.04**																
6. Cooperation	**.10**	**.07**	**-.14**	**-.03**	**.06**															
7. Courage	**.26**	**.16**	**--**	**.10**	**--**	**--**														
8. Dominance	**.32**	**.10**	**.13**	**.23**	**.13**	**-.06**	**.25**													
9. Even Tempered	**.15**	**.22**	**-.05**	**-.04**	**.12**	**.30**	**.10**	**-.01**												
10. Intellectual Efficiency	**.29**	**.19**	**.07**	**.09**	**.09**	.00	**.22**	**.29**	**.12**											
11. Non-Delinquency	**.21**	**.01**	**-.17**	**-.14**	**.12**	**.23**	**.07**	**-.01**	**.24**	**.04**										
12. Optimism	**.17**	**.25**	**.02**	**.09**	**.10**	**.14**	**.08**	**.13**	**.21**	**.13**	**.13**									
13. Order	**.21**	**-.07**	**-.08**	**-.05**	**.08**	**.08**	**.01**	**.09**	**.03**	**.09**	**.13**	**.03**								
14. Physical Conditioning	**.21**	**.05**	**.25**	**.09**	**.09**	**-.05**	**.15**	**.19**	**-.06**	**.07**	**-.04**	**.05**	**.07**							
15. Responsibility	**.36**	**.12**	**--**	**-.05**	**.14**	**.15**	**.15**	**.21**	**.21**	**.22**	**.23**	**.20**	**.17**	**.09**						
16. Self-Control	**.23**	**.09**	**--**	**-.10**	**--**	**.14**	**.09**	**.05**	**.22**	**.17**	**.26**	**.09**	**.19**	**-.04**	**.22**					
17. Selflessness	**.17**	**-.04**	**-.04**	**-.05**	**.09**	**.23**	**.10**	**.06**	**.15**	**.04**	**.18**	**.09**	**.10**	**.00**	**.24**	**.09**				
18. Situational Awareness	**.22**	**.15**	**.10**	**.04**	**.07**	.00	**.20**	**.14**	**.14**	**.28**	**.13**	**.10**	**.17**	**.08**	**--**	**--**	**.05**			
19. Sociability	**.12**	**.10**	**--**	**.35**	**.16**	**.12**	**.12**	**.24**	**.07**	**.09**	.00	**.15**	**.01**	**.05**	**.08**	**-.07**	**.16**	**.05**		
20. Team Orientation	**.11**	**.05**	**--**	**.14**	**.13**	**--**	**.02**	**.12**	**.11**	.00	**.05**	**.09**	**.05**	**.07**	**.02**	**.05**	**.20**	**--**	**.26**	
21. Tolerance	**.11**	**.03**	**--**	**.05**	**.08**	**.14**	**.08**	**.05**	**.16**	**.14**	**.07**	**.10**	**.03**	**-.05**	**.11**	**.11**	**.28**	**.10**	**.20**	**.13**

Note. Results are limited to the Applicant Sample (Non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data, n = 100,555 – 819,707. Not all TAPAS scales were administered in every version; missing correlations indicate that the scales were not administered on the same version. The correlation between the Can-Do and Will-Do predictor composites is r = .18; the correlation between the Can-Do and Adaptation predictor composites is r = .40; the correlation between the Will-Do and Adaptation predictor composites is r = .53. All correlations among the predictor composites are statistically significant at $p < .01$ (two-tailed). Correlations in bold in table are statistically significant, $p < .01$ (two-tailed).

Table A.10. Correlations among TAPAS Scale Scores in the Applicant Sample by Education Tier

	TAPAS Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Achievement		**.09**	**.09**	**.06**	**.22**	**.11**	**.25**	**.30**	**.15**	**.29**	**.24**	**.17**	**.21**	**.22**	**.36**	**.23**	**.17**	**.21**	**.11**	**.15**	**.10**
2	Adjustment	**.10**		**.11**	**.11**	**.04**	**.08**	**.12**	**.07**	**.21**	**.17**	**.05**	**.25**	**-.05**	**.03**	**.11**	**.11**	**-.03**	**.14**	**.10**	**.03**	**.05**
3	Adventure Seeking	**.10**	**.15**		**.19**	**.08**	**-.15**	**--**	**.14**	**-.10**	**.06**	**-.16**	.02	**-.05**	**.24**	**--**	**--**	**-.03**	**.09**	**--**	**--**	**--**
4	Attention Seeking	**.04**	**.11**	**.17**		**.07**	**-.03**	**.12**	**.24**	**-.03**	**.09**	**-.10**	**.08**	**-.04**	**.08**	**-.05**	**-.08**	**-.03**	**.04**	**.38**	**.17**	**.08**
5	Commitment to Serve	**.21**	**.05**	**.04**	**.04**		**.06**	**--**	**.13**	**.14**	**.11**	**.11**	**.11**	**.08**	**.11**	**.18**	**--**	**.10**	**.08**	**.16**	**.16**	**.08**
6	Cooperation	**.10**	**.07**	**-.14**	**-.03**	**.06**		**--**	**-.06**	**.31**	.01	**.25**	**.16**	**.08**	**-.05**	**.16**	**.15**	**.23**	-.01	**.13**	**--**	**.14**
7	Courage	**.26**	**.16**	**--**	**.10**	**--**	**--**		**.24**	**.08**	**.21**	**.10**	**.07**	**.06**	**.15**	**.17**	**.11**	**.08**	**.17**	**.10**	**.03**	**.07**
8	Dominance	**.32**	**.10**	**.13**	**.23**	**.13**	**-.06**	**.25**		**-.02**	**.27**	.01	**.09**	**.11**	**.18**	**.19**	**.05**	**.04**	**.13**	**.24**	**.15**	**.04**
9	Even Tempered	**.14**	**.22**	**-.04**	**-.04**	**.12**	**.30**	**.10**	**-.01**		**.11**	**.30**	**.23**	**.04**	**-.06**	**.23**	**.22**	**.16**	**.11**	**.09**	**.14**	**.16**
10	Intellectual Efficiency	**.29**	**.19**	**.07**	**.09**	**.08**	.00	**.22**	**.29**	**.12**		**.08**	**.11**	**.12**	**.09**	**.22**	**.18**	**.03**	**.28**	**.08**	.03	**.11**
11	Non-Delinquency	**.20**	**.01**	**-.17**	**-.14**	**.12**	**.23**	**.06**	**-.01**	**.24**	**.04**		**.17**	**.14**	**-.04**	**.28**	**.30**	**.22**	**.13**	**.05**	**.09**	**.11**
12	Optimism	**.17**	**.25**	**.02**	**.09**	**.10**	**.14**	**.08**	**.13**	**.21**	**.13**	**.13**		**.04**	**.03**	**.18**	**.10**	**.12**	**.10**	**.16**	**.10**	**.11**
13	Order	**.21**	**-.07**	**-.09**	**-.05**	**.08**	**.08**	**.01**	**.09**	**.03**	**.09**	**.13**	**.03**		**.14**	**.19**	**.19**	**.12**	**.17**	-.01	**.09**	**.02**
14	Physical Conditioning	**.21**	**.06**	**.25**	**.09**	**.09**	**-.05**	**.15**	**.19**	**-.05**	**.07**	**-.04**	**.05**	**.07**		**.08**	-.01	**.02**	**.09**	**.02**	**.06**	**-.04**
15	Responsibility	**.36**	**.12**	**--**	**-.05**	**.14**	**.15**	**.15**	**.21**	**.20**	**.22**	**.22**	**.20**	**.17**	**.09**		**.24**	**.24**	**--**	**.09**	**.04**	**.13**
16	Self-Control	**.23**	**.09**	**--**	**-.10**	**--**	**.14**	**.09**	**.05**	**.22**	**.17**	**.26**	**.09**	**.19**	**-.04**	**.22**		**.09**	**--**	**-.06**	**.06**	**.10**
17	Selflessness	**.17**	**-.04**	**-.04**	**-.05**	**.09**	**.23**	**.11**	**.06**	**.15**	**.04**	**.17**	**.09**	**.10**	**-.01**	**.24**	**.09**		**.04**	**.17**	**.26**	**.25**
18	Situational Awareness	**.22**	**.15**	**.10**	**.04**	**.07**	.00	**.20**	**.14**	**.14**	**.28**	**.13**	**.10**	**.17**	**.08**	**--**	**--**	**.05**		-.03	**--**	.03
19	Sociability	**.12**	**.10**	**--**	**.34**	**.16**	**.12**	**.12**	**.24**	**.07**	**.09**	.00	**.15**	**.01**	**.05**	**.08**	**-.07**	**.16**	**.05**		**.30**	**.22**
20	Team Orientation	**.10**	**.05**	**--**	**.14**	**.12**	**--**	**.02**	**.12**	**.10**	**.00**	**.05**	**.09**	**.05**	**.07**	**.02**	**.05**	**.19**	**--**	**.25**		**.15**
21	Tolerance	**.11**	**.03**	**--**	**.05**	**.08**	**.14**	**.08**	**.05**	**.16**	**.14**	**.07**	**.10**	**.04**	**-.05**	**.11**	**.11**	**.28**	**.10**	**.20**	**.12**	

Note. Results are limited to the Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data. Correlations below the diagonal are for Education Tier 1 applicants, n = 94,957-778,137. Correlations above the diagonal are for Education Tier 2 applicants, n = 5,556-41,570. Not all TAPAS scales were administered in every version; missing correlations indicate that the scales were not administered on the same version. For Tier 1 applicants, the correlation between the Can-Do and Will-Do predictor composites is r = .20; the correlation between the Can-Do and Adaptation predictor composites is r = .41; the correlation between the Will-Do and Adaptation predictor composites is r = .52. For Tier 2 applicants, the correlation between Can-Do and Will-Do predictor composites is r = .18; the correlation between the Can-Do and Adaptation predictor composites is r = .42; the correlation between the Will-Do and Adaptation predictor composites is r = .50. All correlations among the predictor composites are statistically significant at $p < .01$ (two-tailed). Correlations in bold in table are statistically significant, $p < .01$ (two-tailed).

Table A.11. Correlations among AFQT, ASVAB Subtests, and AA Composite Scores in the TOPS Applicant Sample

	Composite/Subtest	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	AFQT																			
	ASVAB Subtests																			
2	Arithmetic Reasoning (AR)	.81																		
3	Assembling Objects (AO)	.43	.46																	
4	Auto & Shop Info (AS)	.36	.29	.25																
5	Electronics Information (EI)	.58	.45	.34	.66															
6	General Science (GS)	.72	.52	.34	.49	.66														
7	Math Knowledge (MK)	.70	.68	.37	.05	.27	.41													
8	Mech Comprehension (MC)	.64	.58	.51	.61	.67	.65	.39												
9	Para Comprehension (PC)	.78	.52	.33	.34	.51	.63	.39	.53											
10	Word Knowledge (WK)	.79	.44	.26	.41	.58	.71	.31	.53	.68										
	Aptitude Area (AA) Composites																			
11	Clerical (CL)	.96	.90	.48	.42	.63	.72	.77	.71	.73	.72									
12	Combat (CO)	.88	.78	.50	.66	.78	.80	.66	.85	.68	.69	.94								
13	Electronics (EL)	.90	.79	.49	.66	.80	.79	.63	.82	.72	.74	.94	.99							
14	Field Artillery (FA)	.89	.81	.51	.64	.76	.78	.67	.85	.68	.69	.95	1.0	.99						
15	General Maintenance (GM)	.85	.77	.49	.72	.81	.80	.59	.84	.66	.68	.91	.99	.99	.99					
16	General Technical (GT)	.96	.88	.44	.40	.60	.72	.61	.66	.78	.79	.97	.88	.91	.89	.87				
17	Mech. Maintenance (MM)	.74	.65	.45	.85	.83	.73	.43	.85	.61	.64	.80	.95	.95	.94	.97	.77			
18	Operators & Food (OF)	.86	.78	.49	.72	.79	.78	.57	.85	.69	.70	.92	.99	.99	.99	1.0	.89	.97		
19	Surveillance & Comm. (SC)	.92	.81	.49	.59	.77	.77	.69	.80	.72	.73	.97	.99	.99	.99	.98	.92	.91	.98	
20	Skilled Technical (ST)	.93	.82	.49	.58	.74	.80	.67	.81	.75	.76	.97	.99	.99	.99	.97	.94	.91	.98	.99

Note. Results are limited to the Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data, n = 766,320-819,707. All correlations are statistically significant, $p < .01$ (two-tailed).

Table A.12. Correlations among AFQT, ASVAB Subtests, and AA Composite Scores by Education Tier

	Composite/Subtest	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	AFQT		.76	.37	.29	.51	.67	.63	.56	.74	.76	.95	.82	.85	.84	.78	.94	.65	.80	.88	.90
	ASVAB Subtests																				
2	Arithmetic Reasoning (AR)	.81		.39	.24	.36	.41	.60	.49	.43	.34	.87	.71	.72	.74	.70	.85	.57	.71	.76	.77
3	Assembling Objects (AO)	.43	.46		.23	.31	.28	.29	.47	.27	.22	.43	.46	.45	.47	.44	.39	.41	.45	.45	.45
4	Auto & Shop Info (AS)	.37	.29	.26		.66	.45	-.03	.59	.27	.33	.38	.68	.67	.65	.74	.34	.87	.73	.59	.57
5	Electronics Information (EI)	.59	.46	.34	.66		.63	.16	.63	.44	.53	.57	.76	.79	.74	.80	.53	.82	.78	.75	.71
6	General Science (GS)	.73	.52	.34	.49	.66		.29	.59	.55	.67	.65	.75	.74	.74	.75	.65	.67	.74	.72	.76
7	Math Knowledge (MK)	.71	.69	.37	.06	.29	.42		.27	.28	.19	.70	.55	.52	.57	.48	.51	.31	.46	.60	.57
8	Mech Comprehension (MC)	.64	.58	.51	.61	.67	.65	.40		.45	.46	.65	.83	.80	.83	.82	.59	.82	.83	.78	.79
9	Para Comprehension (PC)	.78	.52	.33	.35	.52	.63	.40	.53		.60	.68	.60	.65	.61	.58	.74	.51	.61	.66	.69
10	Word Knowledge (WK)	.79	.44	.27	.41	.58	.71	.32	.53	.68		.67	.63	.68	.62	.61	.76	.55	.64	.67	.71
	Aptitude Area (AA) Composites																				
11	Clerical (CL)	.96	.90	.48	.42	.63	.72	.77	.71	.73	.72		.91	.92	.92	.88	.96	.75	.89	.95	.96
12	Combat (CO)	.88	.78	.50	.67	.78	.80	.67	.85	.69	.70	.94		.99	1.0	.99	.83	.94	.99	.99	.98
13	Electronics (EL)	.90	.79	.49	.66	.80	.79	.64	.82	.72	.74	.95	.99		.99	.99	.87	.94	.99	.99	.99
14	Field Artillery (FA)	.89	.81	.51	.64	.76	.78	.68	.85	.69	.69	.95	1.0	.99		.99	.85	.93	.99	.99	.99
15	General Maintenance (GM)	.85	.77	.49	.72	.82	.80	.60	.84	.67	.69	.91	.99	.99	.99		.81	.97	1.0	.97	.96
16	General Technical (GT)	.96	.88	.44	.41	.61	.72	.62	.67	.79	.80	.97	.88	.91	.90	.87		.69	.84	.89	.92
17	Mech. Maintenance (MM)	.74	.66	.45	.85	.83	.73	.45	.85	.61	.64	.81	.95	.95	.94	.97	.77		.97	.90	.88
18	Operators & Food (OF)	.86	.78	.49	.72	.79	.79	.58	.85	.69	.71	.92	.99	.99	.99	1.0	.89	.97		.97	.97
19	Surveillance & Comm. (SC)	.92	.82	.49	.59	.77	.77	.70	.80	.72	.73	.97	.99	.99	.99	.98	.92	.92	.98		.99
20	Skilled Technical (ST)	.93	.82	.49	.58	.74	.80	.68	.81	.75	.76	.97	.99	.99	.99	.97	.94	.91	.98	.99	

Note. Results are limited to the Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data. Correlations below the diagonal are for Education Tier 1 applicants, n = 726,447-778,137. Correlations above the diagonal are for Education Tier 2 applicants, n = 39,873-41,570. All correlations are statistically significant, $p < .01$ (two-tailed).

Table A.13. Correlations among AFQT, ASVAB Subtests, AA Composite Scores with TAPAS Composites and TAPAS Scales in the TOPS Applicant Sample

		ASVAB Subtests								
	AFQT	AR	AO	AS	EI	GS	MK	MC	PC	WK
Individual TAPAS Scales										
Achievement	**.05**	**.06**	**.01**	**.09**	**.04**	**.01**	**.01**	**.03**	**.06**	**.03**
Adjustment	**.12**	**.10**	**.05**	**.14**	**.14**	**.14**	**.03**	**.14**	**.12**	**.12**
Adventure Seeking	**.10**	**.10**	**.10**	**.20**	**.16**	**.14**	**.03**	**.20**	**.08**	**.08**
Attention Seeking	**.04**	**.05**	.00	**-.02**	**-.01**	.00	**.02**	**.00**	**.04**	**.01**
Commitment to Serve	**-.14**	**-.10**	**-.07**	**.01**	**-.05**	**-.10**	**-.13**	**-.07**	**-.09**	**-.11**
Cooperation	**-.07**	**-.06**	**-.04**	**-.09**	**-.08**	**-.08**	**-.03**	**-.09**	**-.06**	**-.07**
Courage	**.08**	**.05**	**.02**	**.14**	**.11**	**.09**	**-.02**	**.10**	**.11**	**.10**
Dominance	**.11**	**.10**	**.02**	**.06**	**.05**	**.06**	**.06**	**.06**	**.11**	**.07**
Even Tempered	**.08**	**.06**	**.04**	**.05**	**.08**	**.07**	**.01**	**.06**	**.09**	**.09**
Intellectual Efficiency	**.31**	**.28**	**.15**	**.12**	**.20**	**.23**	**.22**	**.21**	**.25**	**.24**
Non-Delinquency	**-.04**	**-.04**	**-.04**	**-.03**	**-.04**	**-.05**	**-.02**	**-.06**	**-.02**	**-.03**
Optimism	**.08**	**.06**	**.02**	**.05**	**.05**	**.06**	**.04**	**.04**	**.09**	**.06**
Order	**-.16**	**-.09**	**-.06**	**-.10**	**-.13**	**-.18**	**-.06**	**-.15**	**-.15**	**-.16**
Physical Conditioning	**.05**	**.06**	**.02**	**.04**	**.01**	**.03**	**.06**	**.05**	**.03**	**.01**
Responsibility	**.14**	**.09**	**.04**	**.11**	**.10**	**.10**	**.04**	**.09**	**.16**	**.14**
Self-Control	**-.02**	**-.01**	**-.01**	**-.02**	**-.01**	**-.04**	**-.03**	**-.03**	**-.01**	**-.02**
Selflessness	**-.07**	**-.06**	**-.06**	**-.13**	**-.11**	**-.09**	**-.01**	**-.12**	**-.05**	**-.07**
Situational Awareness	**.02**	**.03**	**.03**	**.12**	**.08**	**.02**	**-.04**	**.07**	**.03**	**.02**
Sociability	**-.11**	**-.09**	**-.09**	**-.06**	**-.10**	**-.11**	**-.08**	**-.11**	**-.09**	**-.10**
Team Orientation	**-.09**	**-.05**	**-.04**	**-.03**	**-.05**	**-.08**	**-.05**	**-.06**	**-.07**	**-.09**
Tolerance	**.05**	.00	**.00**	**-.10**	**-.01**	**.03**	**.02**	**-.04**	**.07**	**.08**
TAPAS Composites										
Can-Do	**.37**	**.32**	**.19**	**.22**	**.28**	**.31**	**.23**	**.30**	**.32**	**.31**
Will-Do	**.10**	**.11**	**.02**	**.09**	**.05**	**.05**	**.06**	**.07**	**.09**	**.05**
Adaptation	**.18**	**.14**	**.09**	**.12**	**.13**	**.16**	**.10**	**.17**	**.16**	**.15**

Note. Results are limited to the Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data, n = 94,785-819,707. AR = Arithmetic Reasoning, AO = Assembling Objects, AS = Auto & Shop Info, EI = Electronics Information, GS = General Science, MK = Math Knowledge, MC = Mechanical Comprehension, PC = Paragraph Comprehension, WK = Word Knowledge, CL = Clerical, CO = Combat, EL = Electronics, FA = Field Artillery, GM = General Maintenance, GT = General Technical, MM = Mechanical Maintenance, OF = Operators & Food, SC = Surveillance and Communications, ST = Skilled Technical. Correlations in bold are statistically significant, $p < .01$ (two-tailed).

Table A.13. (Continued)

	Aptitude Area (AA) Composites									
	CL	CO	EL	FA	GM	GT	MM	OF	SC	ST
Individual TAPAS Scales										
Achievement	**.06**	**.06**	**.06**	**.06**	**.06**	**.06**	**.08**	**.07**	**.06**	**.06**
Adjustment	**.12**	**.14**	**.15**	**.14**	**.15**	**.13**	**.16**	**.15**	**.14**	**.14**
Adventure Seeking	**.12**	**.17**	**.17**	**.17**	**.18**	**.11**	**.20**	**.18**	**.15**	**.15**
Attention Seeking	**.03**	**.01**	**.02**	**.02**	**.01**	**.04**	.00	**.01**	**.02**	**.02**
Commitment to Serve	**-.13**	**-.11**	**-.11**	**-.11**	**-.09**	**-.12**	**-.07**	**-.10**	**-.12**	**-.12**
Cooperation	**-.08**	**-.09**	**-.09**	**-.09**	**-.10**	**-.08**	**-.10**	**-.10**	**-.09**	**-.09**
Courage	**.08**	**.10**	**.11**	**.10**	**.11**	**.09**	**.13**	**.12**	**.10**	**.10**
Dominance	**.10**	**.09**	**.10**	**.09**	**.09**	**.11**	**.08**	**.09**	**.10**	**.10**
Even Tempered	**.07**	**.07**	**.08**	**.07**	**.08**	**.09**	**.07**	**.08**	**.08**	**.08**
Intellectual Efficiency	**.31**	**.29**	**.29**	**.29**	**.28**	**.32**	**.25**	**.28**	**.30**	**.30**
Non-Delinquency	**-.04**	**-.05**	**-.05**	**-.05**	**-.05**	**-.04**	**-.05**	**-.05**	**-.05**	**-.05**
Optimism	**.08**	**.07**	**.07**	**.07**	**.07**	**.08**	**.07**	**.07**	**.07**	**.08**
Order	**-.14**	**-.16**	**-.16**	**-.16**	**-.16**	**-.15**	**-.15**	**-.16**	**-.16**	**-.16**
Physical Conditioning	**.06**	**.06**	**.05**	**.06**	**.06**	**.05**	**.05**	**.06**	**.05**	**.05**
Responsibility	**.13**	**.13**	**.14**	**.13**	**.13**	**.14**	**.13**	**.14**	**.13**	**.14**
Self-Control	**-.02**	**-.03**	**-.03**	**-.03**	**-.03**	**-.02**	**-.03**	**-.03**	**-.03**	**-.03**
Selflessness	**-.07**	**-.11**	**-.11**	**-.11**	**-.12**	**-.07**	**-.13**	**-.12**	**-.10**	**-.10**
Situational Awareness	**.03**	**.06**	**.06**	**.06**	**.07**	**.04**	**.09**	**.07**	**.05**	**.05**
Sociability	**-.12**	**-.12**	**-.12**	**-.12**	**-.12**	**-.11**	**-.11**	**-.12**	**-.12**	**-.12**
Team Orientation	**-.08**	**-.08**	**-.08**	**-.07**	**-.07**	**-.08**	**-.06**	**-.07**	**-.08**	**-.08**
Tolerance	**.03**	**-.02**	**-.01**	**-.01**	**-.02**	**.05**	**-.05**	**-.02**	.00	**.01**
TAPAS Composites										
Can-Do	**.38**	**.37**	**.38**	**.38**	**.37**	**.38**	**.34**	**.37**	**.38**	**.38**
Will-Do	**.10**	**.10**	**.10**	**.10**	**.10**	**.10**	**.10**	**.10**	**.10**	**.10**
Adaptation	**.18**	**.18**	**.18**	**.18**	**.18**	**.18**	**.17**	**.19**	**.18**	**.19**

Note. Results are limited to the Applicant Sample (non-prior service, Education Tier 1 and 2, AFQT Category IV and above) with valid TAPAS score data, n = 94,785-819,707. AR = Arithmetic Reasoning, AO = Assembling Objects, AS = Auto & Shop Info, EI = Electronics Information, GS = General Science, MK = Math Knowledge, MC = Mechanical Comprehension, PC = Paragraph Comprehension, WK = Word Knowledge, CL = Clerical, CO = Combat, EL = Electronics, FA = Field Artillery, GM = General Maintenance, GT = General Technical, MM = Mechanical Maintenance, OF = Operators & Food, SC = Surveillance and Communications, ST = Skilled Technical. Correlations in bold are statistically significant, $p < .01$ (two-tailed).

Table A.14. Group Differences on the AFQT and TAPAS by Gender

	Male		Female		
Measure	*M*	*SD*	*M*	*SD*	*d*
AFQT	55.67	22.69	49.33	21.47	**-.28**
Individual TAPAS Scales					
Achievement	-.03	.99	0.07	.96	**.09**
Adjustment	.04	.97	-0.27	.99	**-.32**
Adventure Seeking	.02	.98	-0.28	.96	**-.30**
Attention Seeking	.00	.98	-0.09	.98	**-.09**
Commitment to Serve	-.02	1.00	-0.01	.96	**.01**
Cooperation	-.02	.98	0.13	.98	**.16**
Courage	.05	.99	-0.18	1.00	**-.23**
Dominance	-.01	.99	-0.02	.96	**-.01**
Even Tempered	.02	.99	0.01	1.00	**-.01**
Intellectual Efficiency	.03	.98	-0.05	.95	**-.08**
Non-Delinquency	-.01	.99	0.17	.95	**.18**
Optimism	-.01	.98	0.04	.98	**.04**
Order	-.06	.96	0.18	1.01	**.25**
Physical Conditioning	.07	.99	-0.27	.97	**-.34**
Responsibility	-.02	.99	0.09	.97	**.11**
Self-Control	-.01	.98	0.04	.98	**.06**
Selflessness	-.06	.98	0.40	.96	**.47**
Situational Awareness	.00	.98	-0.21	.99	**-.22**
Sociability	.01	1.00	0.10	1.01	**.09**
Team Orientation	.06	1.00	-0.08	1.00	**-.14**
Tolerance	-.02	.98	0.29	.96	**.32**
TAPAS Composites					
Can-Do	101.08	20.18	95.77	19.50	**-.27**
Will-Do	100.53	19.79	97.24	18.94	**-.17**
Adaptation	101.71	19.41	93.73	19.68	**-.41**

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data. Females are the referent group. Sample sizes for Females range from 21,411 to 178,093; for Males 75,381 to 618,649. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

Table A.15. Group Differences on the AFQT and TAPAS by Race and Ethnicity

	White, Non-Hispanic		Black			Hispanic			Asian		
Measure	*M*	*SD*	*M*	*SD*	*d*	*M*	*SD*	*d*	*M*	*SD*	*d*
AFQT	59.91	21.97	43.61	19.10	**-.77**	47.10	20.53	**-.59**	60.09	23.77	.01
Individual TAPAS Scales											
Achievement	.05	1.00	-.03	.96	**-.08**	-.06	.97	**-.12**	-.26	.97	**-.32**
Adjustment	.05	.99	-.11	.95	**-.17**	-.12	.96	**-.18**	-.24	.96	**-.30**
Adventure Seeking	.15	.97	-.49	.91	**-.67**	-.05	.91	**-.21**	-.17	.92	**-.33**
Attention Seeking	-.06	1.00	.08	.96	**.13**	-.02	.95	**.03**	-.02	.96	**.03**
Commitment to Serve	.03	.99	-.04	.98	**-.07**	.01	.98	**-.02**	-.18	1.01	**-.22**
Cooperation	-.03	.98	.14	.98	**.18**	.01	.97	**.04**	.09	.97	**.12**
Courage	.13	.98	-.17	.99	**-.30**	-.03	.97	**-.16**	-.38	.99	**-.52**
Dominance	.01	1.02	.02	.91	**.02**	-.06	.95	**-.07**	-.29	.94	**-.29**
Even Tempered	.05	1.01	.03	.98	**-.02**	-.01	.97	**-.06**	-.13	.95	**-.17**
Intellectual Efficiency	.04	.99	.02	.92	**-.01**	-.07	.94	**-.10**	-.14	.96	**-.18**
Non-Delinquency	.03	1.00	.09	.97	**.05**	.00	.96	**-.03**	-.10	.93	**-.13**
Optimism	.03	.99	.01	.98	**-.02**	-.02	.97	**-.05**	-.15	.96	**-.19**
Order	-.13	.98	.17	.96	**.31**	.07	.94	**.21**	.16	.93	**.29**
Physical Conditioning	.05	1.01	-.12	.95	**-.18**	-.03	.98	**-.08**	-.15	.96	**-.20**
Responsibility	.11	.98	-.02	.97	**-.13**	-.16	.99	**-.27**	-.30	1.00	**-.41**
Self-Control	-.07	.98	.17	.96	**.24**	.05	.97	**.12**	.02	.96	**.09**
Selflessness	-.01	1.00	.21	.98	**.22**	.04	.97	**.05**	.10	.94	**.12**
Situational Awareness	-.03	1.00	-.03	.97	.00	-.07	.97	**-.05**	-.14	.99	**-.11**
Sociability	.02	1.03	.10	.97	**.09**	.04	.98	**.02**	-.07	.98	**-.09**
Team Orientation	.00	1.01	.04	1.00	**.05**	.08	1.00	**.08**	.19	1.01	**.19**
Tolerance	-.05	1.01	.16	.94	**.21**	.20	.94	**.25**	.30	.91	**.35**
TAPAS Composites											
Can-Do	102.33	20.60	97.45	18.73	**-.24**	96.82	19.28	**-.27**	94.22	19.50	**-.40**
Will-Do	101.29	20.18	98.38	18.44	**-.15**	98.71	19.09	**-.13**	93.72	19.09	**-.38**
Adaptation	102.19	19.84	96.20	19.16	**-.31**	98.57	19.35	**-.18**	95.74	19.18	**-.33**

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data. The Minority group is the referent group. Sample sizes for White, Non-Hispanic applicants range from 54,418 to 437,128; Black applicants from 24,361 to 187,649; Hispanic applicants from 15,538 to 129,982; Asian applicants from 3,913 to 39,511. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

Table A.16. Group Differences on the AFQT and TAPAS by Tier

	Tier 1		Tier 2		
Measure	*M*	*SD*	*M*	*SD*	*d*
AFQT	54.08	22.64	52.19	18.72	**.08**
Individual TAPAS Scales					
Achievement	-.01	.98	.11	.98	**-.13**
Adjustment	-.03	.98	.12	.97	**-.15**
Adventure Seeking	-.06	.98	.01	.98	**-.07**
Attention Seeking	-.02	.98	.02	1.01	**-.04**
Commitment to Serve	-.02	.99	.22	.93	**-.24**
Cooperation	.02	.98	.00	.99	**.02**
Courage	-.01	.99	.21	.97	**-.22**
Dominance	-.02	.98	-.04	1.00	**.02**
Even Tempered	.01	.99	.22	1.01	**-.21**
Intellectual Efficiency	.00	.97	.14	.94	**-.15**
Non-Delinquency	.04	.98	-.02	1.03	**.06**
Optimism	.01	.98	.03	.99	**-.02**
Order	-.01	.98	-.03	.97	**.02**
Physical Conditioning	.00	.99	-.18	.96	**.18**
Responsibility	.00	.99	.12	1.00	**-.11**
Self-Control	.00	.98	.12	.99	**-.13**
Selflessness	.05	.99	.02	1.02	**.03**
Situational Awareness	-.05	.99	.16	.98	**-.22**
Sociability	.03	1.00	.11	1.04	**-.08**
Team Orientation	.03	1.00	.10	1.07	**-.07**
Tolerance	.05	.99	.16	.99	**-.11**
TAPAS Composites					
Can-Do	99.70	20.14	102.12	19.61	**-.12**
Will-Do	99.84	19.65	98.59	19.24	**.06**
Adaptation	99.93	19.77	98.52	19.05	**.07**

Note. Results are limited to the TOPS Applicant Sample (non-prior service, Education Tier 1 and 2, and AFQT ≥ 10) with valid TAPAS score data. Tier 2 is the referent group. Sample sizes for Tier 1 Soldiers range from 94,957 to 778,717; for Tier 2 Soldiers 5,645 to 41,583. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

APPENDIX B

CORRELATIONS AMONG CRITERION MEASURES IN THE IMT AND IN-UNIT VALIDATION SAMPLES

Table B.1. Correlations among the Performance Rating Scales (PRS) in the IMT Validation Sample

Domain/PRS		1	2	3	4	5	6
	Army-Wide						
1.	Adjustment to the Army						
2.	Effort & Discipline	.70					
3.	MOS Qualification Knowledge	.71	.64				
4.	Physical Fitness & Bearing	.64	.64	.58			
5.	Working with Others	.70	.73	.65	.60		
6.	Overall Performance	.66	.63	.64	.57	.60	
	MOS-Specific						
7.	11B/C/X + 18X	.68	.65	.69	.61	.67	.57
8.	12B	.56	.40	.60	.47	.49	.62
9.	13F	.67	.52	.75	.56	.69	.77
10.	19K	.57	.56	.72	.56	.41	.72
11.	31B	.68	.64	.73	.54	.68	.59
12.	42A	.64	.63	.70	.41	.65	.71
13.	68W	.74	.68	.74	.61	.71	.46
14.	88M	.67	.62	.65	.62	.64	.60
15.	All MOS Combined [a]	.69	.65	.72	.58	.66	.56

Note. Army-wide PRS: n = 11,203-11,922. MOS-specific PRS: 11B, n = 2,063-2,066; 12B, n = 323-324; 13F, n = 123; 19D, 257-269; 19K, n = 401-402; 31B, n = 1,495-1,507; 42A, n = 384; 68W, n = 818-887; 88M, n = 1,338-1,345. All MOS Combined, n = 7,347-7,426. Ratings on PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results for MOS with fewer than 100 cases are not reported. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table B.2. Correlations among the Performance Rating Scales (PRS) in the In-Unit Validation Sample

PRS		1	2	3	4	5	6
1.	Can Do [a]						
2.	Effort & Discipline [a]	.78					
3.	Physical Fitness & Bearing	.54	.58				
4.	Self-Management [a]	.74	.76	.57			
5.	Working with Others [a]	.78	.76	.52	.72		
6.	Adjustment to Army Life	.71	.75	.65	.72	.67	
7.	Overall Leadership Potential	.67	.68	.56	.66	.63	.76

Note. Army-wide PRS, n = 5,192-5,627. Ratings on PRS range from 1 and 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Ratings composite comprises two or more Army-wide PRS.

Table B.3. Correlations among the Army Life Questionnaire (ALQ) Scales in the IMT and In-Unit Validation Samples

Scale		1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Affective Commitment		**.78**	**.42**	**.53**		**.60**	**.52**	**-.56**		**-.15**	**-.15**	**.05**	
2.	Army Fit	**.84**		**.45**	**.54**		**.59**	**.55**	**-.65**		**-.20**	**-.17**	**.10**	
3.	MOS Fit	**.49**	**.49**		**.57**		**.29**	**.24**	**-.33**		**-.10**	**-.09**	**.03**	
4.	MOS Satisfaction	**.53**	**.54**	**.57**			**.39**	**.31**	**-.38**		**-.11**	**-.10**	.01	
5.	Normative Commitment	**.69**	**.72**	**.41**										
6.	Army Career Intentions	**.55**	**.52**	**.26**		**.41**		**.80**	**-.45**		**-.14**	**-.13**	**.07**	
7.	Army Reenlistment Intentions	**.52**	**.52**	**.28**		**.44**	**.84**				**-.11**	**-.10**	**.07**	
8.	Attrition Cognition	**-.62**	**-.68**	**-.41**		**-.73**	**-.45**	**-.49**			**.22**	**.19**	**-.13**	
9.	Army Life Adjustment	**.44**	**.60**	**.34**		**.44**	**.34**	**.38**	**-.51**					
10.	Disciplinary Incidents (#)	**-.07**	**-.10**	**-.08**		**-.06**	**-.04**	**-.05**	**.10**	**-.17**		**.80**	**-.07**	
11.	Disciplinary Incidents (Y/N)	**-.06**	**-.08**	**-.07**		**-.04**	**-.05**	**-.05**	**.08**	**-.16**	**.86**		**-.08**	
12.	APFT Score	**.03**	**.08**	**.06**		**.05**	**.02**	**.03**	**-.10**	**.22**	**-.14**	**-.17**		
13.	Training Achievement (#)	**.05**	**.06**	**.05**		**-.01**	**.08**	**.06**	**-.03**	**.12**	**-.08**	**-.10**	**.25**	
14.	Training Restarts (#) [a]	**-.03**	**-.04**	**-.05**		**-.03**	**-.02**	**-.02**	**.06**	**-.10**	**.15**	**.14**	**-.07**	**-.06**

Note. Correlations below the diagonal reflect the IMT ALQ, n = 37,982- 41,151. Correlations above the diagonal reflect the in-unit ALQ, n = 6,671-6,694. Missing values reflect the scales that were not administered in either IMT or In-Unit. Correlations in bold are statistically significant, $p < .01$ (two-tailed).

[a] Training Restarts (#) is based on the total number of affirmative responses to whether a Soldier restarted from BCT or OSUT or whether a Soldier repeated a block or module at AIT or OSUT .

Table B.4. Correlations between the Army Life Questionnaire (ALQ) Scales and Job Knowledge Tests (JKTs) in the IMT and In-Unit Validation Samples

Setting /Scale	JKTs												
	WTBD	All MOS Combined [a]	11B	12B	13D	13F	19D	19K	31B	42A	68W	88M	91B
IMT													
Affective Commitment	**.10**	**.10**	**.12**	**.22**	**.14**	**.18**	**.18**	**.19**	**.05**	**.16**	**.05**	**.05**	**.14**
Army Fit	**.15**	**.14**	**.17**	**.27**	**.15**	**.20**	**.23**	**.21**	**.07**	**.17**	**.12**	**.08**	**.16**
MOS Fit	**.13**	**.10**	**.14**	**.13**	-.04	**.22**	**.15**	**.14**	**.06**	-.03	**.16**	-.01	**.28**
Normative Commitment	**.21**	**.20**	**.24**	**.34**	**.24**	**.27**	**.27**	**.25**	**.15**	**.19**	**.18**	**.16**	**.16**
Army Career Intentions	**-.03**	.00	.00	.03	-.06	.02	.01	**.05**	-.01	.00	.00	**-.04**	.01
Army Reenlistment Intentions	**.04**	**.05**	**.06**	**.11**	-.01	.07	**.09**	**.10**	.02	.09	.05	**.02**	.05
Attrition Cognitions	**-.18**	**-.16**	**-.19**	**-.27**	**-.21**	**-.17**	**-.25**	**-.19**	**-.10**	**-.17**	**-.16**	**-.11**	**-.14**
Army Life Adjustment	**.12**	**.11**	**.13**	**.17**	**.11**	**.20**	**.10**	**.05**	**.08**	**.14**	**.14**	**.09**	**.11**
Disciplinary Incidents (#)	**-.04**	**-.04**	**-.04**	-.02	-.05	**-.03**	**.00**	**-.03**	-.04	-.06	-.05	**-.02**	**-.04**
Disciplinary Incidents (Y/N)	**-.03**	**-.02**	**-.03**	.00	-.02	**-.04**	**-.01**	**-.02**	-.04	**-.04**	**-.03**	**-.02**	**-.01**
APFT Score	**.06**	**.02**	**.05**	.03	.07	.06	**.10**	-.04	.00	.01	.01	-.02	-.03
Training Achievement (#)	**-.09**	**-.08**	**-.11**	**-.10**	**.11**	.02	**-.07**	**-.14**	**-.04**	**-.10**	.01	**-.09**	**-.12**
Training Restarts (#) [b]	**-.02**	**-.03**	-.01	-.05	-.04	.05	-.01	-.06	**-.10**	**-.06**	**-.07**	-.02	.00
In-Unit													
Affective Commitment	**.04**	--	--	--	--	--	--	--	--	--	--	--	--
Army Fit	**.11**	--	--	--	--	--	--	--	--	--	--	--	--
MOS Fit	**.09**	--	--	--	--	--	--	--	--	--	--	--	--
MOS Satisfaction	**-.04**	--	--	--	--	--	--	--	--	--	--	--	--
Army Career Intentions	-.01	--	--	--	--	--	--	--	--	--	--	--	--
Army Reenlistment Intentions	**.03**	--	--	--	--	--	--	--	--	--	--	--	--
Attrition Cognitions	**-.14**	--	--	--	--	--	--	--	--	--	--	--	--
Disciplinary Incidents (#)	**-.08**	--	--	--	--	--	--	--	--	--	--	--	--
Disciplinary Incidents (Y/N)	**-.08**	--	--	--	--	--	--	--	--	--	--	--	--
APFT Score	.01	--	--	--	--	--	--	--	--	--	--	--	--

Note. WTBD = Warrior Tasks and Battle Drills. IMT: All MOS Combined, *n* = 28,668-27,244; 11B, *n* = 10,312-10,587; 12B, *n* = 479-525; 13D, n= 285-296; 13F, *n* = 477-507; 19D, *n* = 647-684; 19K, *n* = 1,247-1,304; 31B, *n* = 4,658-5,081; 42A, *n* = 1,136-1,163; 68W, *n* = 3,099-3,624; 88M, *n* = 3,826-4,188; 91B, *n* = 595-709; WTBD, *n* = 35,573-37,312. In-Unit: WTBD, *n* = 5,582-5,811. Results with fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

[b] Training Restarts (#) is based on the total number of affirmative responses to whether a Soldier restarted from BCT or OSUT or whether a Soldier repeated a block or module at AIT or OSUT.

Table B.5. Correlations between the Army Life Questionnaire (ALQ) Scales and Performance Rating Scales (PRS) in the IMT Validation Sample

Domain/PRS	AFF COM	Army Fit	MOS Fit	NORM COM	CAR INT	RENL INT	ATT COG	AL ADJ	DIS INC #	APFT	TRN ACH	TRN REST
Army-Wide												
Adjustment to the Army	**.07**	**.09**	**.05**	**.06**	**.03**	**.05**	**-.08**	**.11**	**-.15**	**.15**	**.10**	**-.04**
Effort & Discipline	**.06**	**.09**	**.02**	**.06**	**.03**	**.04**	**-.08**	**.11**	**-.15**	**.15**	**.09**	-.03
MOS Qualification Knowledge	**.04**	**.06**	**.03**	**.04**	**.02**	**.03**	**-.05**	**.10**	**-.12**	**.14**	**.07**	**-.04**
Physical Fitness & Bearing	**.04**	**.07**	.02	**.04**	**.03**	**.04**	**-.07**	**.12**	**-.13**	**.31**	**.14**	**-.04**
Working with Others	**.05**	**.07**	.01	**.05**	**.02**	**.03**	**-.06**	**.08**	**-.11**	**.12**	**.07**	-.01
Overall Performance	**.06**	**.09**	**.06**	**.07**	**.03**	**.05**	**-.10**	**.14**	**-.18**	**.21**	**.14**	**-.07**
MOS-Specific												
All MOS Combined [a]	**.07**	**.08**	.00	**.05**	**.04**	**.04**	**-.06**	**.08**	**-.09**	**.09**	**.07**	**-.03**
11B/C/X + 18X	.04	.04	**.08**	**.05**	.01	.02	-.06	.02	**-.07**	**.06**	**.05**	-.04
12B	-.04	-.03	-.02	-.07	.01	-.03	.07	.12	**-.15**	**.35**	**.19**	-.12
13F	.05	.05	**.19**	.11	-.06	.01	-.06	.06	-.13	.14	.04	-.17
19D	.06	.10	**.13**	.02	**.12**	**.15**	-.10	**.17**	**-.19**	**.21**	**.33**	-.10
19K	**.13**	**.11**	**.11**	**.11**	**.11**	**.10**	**-.12**	**.17**	**-.16**	**.18**	**.18**	-.07
31B	**.05**	**.06**	.02	.04	.02	.02	**-.06**	**.11**	**-.12**	**.06**	**.13**	.01
42A	.09	**.14**	**.10**	**.12**	.09	**.11**	-.09	**.20**	**-.15**	**.21**	**.12**	**-.27**
68W	**.09**	**.10**	.04	**.09**	**.07**	.06	**-.07**	**.06**	-.03	**.14**	.00	**.09**
88M	.05	.04	.00	.05	-.02	-.02	-.01	.03	**-.07**	**.11**	.04	**-.08**

Note. AFF COM = Affective Commitment; NORM COM = Normative Commitment; CAR INT = Army Career Intentions; RENL INT = Army Reenlistment Intentions; ATT COG = Attrition Cognitions; AL ADJ = Army Life Adjustment; DIS INC # = Disciplinary Incidents (#); DIS INC Y/N = Disciplinary Incidents (Y/N); APFT = APFT Score; TRN ACH = Training Achievements (#); TRN REST = Training Restarts (#). Army-wide PRS: *n* = 10,994-11,483. MOS-specific PRS: All MOS Combined *n* = 7,150-7,550; 11B *n* = 2,047-2,099; 12B, *n* = 213-235; 13F, *n* = 113-119; 19D, *n* = 267-286; 19K *n* = 389-406; 31B *n* = 1,434-1,570; 42A *n* = 377-386; 68W *n* = 811-1,014; 88M *n* = 1,253-1,308. Results for MOS with fewer than 100 cases are not reported. Ratings on IMT PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table B.6. Correlations between the Army Life Questionnaire (ALQ) Scales and Performance Rating Scales (PRS) in the In-Unit Validation Sample

	In-Unit ALQ Scale								
PRS	AFF COM	Army Fit	MOS Fit	MOS SAT	CAR INT	RENL INT	ATT COG	DIS INC #	APFT
Can Do [a]	**.06**	**.09**	**.07**	.03	**.05**	**.07**	**-.12**	**-.19**	**.15**
Effort & Discipline [a]	**.11**	**.15**	**.09**	**.08**	**.09**	**.10**	**-.17**	**-.28**	**.13**
Physical Fitness & Bearing	**.09**	**.15**	**.07**	**.08**	**.09**	**.10**	**-.19**	**-.21**	**.37**
Self-Management [a]	**.09**	**.13**	**.06**	**.04**	**.08**	**.08**	**-.15**	**-.25**	**.14**
Working with Others [a]	**.07**	**.09**	**.05**	**.03**	**.05**	**.05**	**-.11**	**-.20**	**.11**
Adjustment to Army Life	**.16**	**.22**	**.10**	**.12**	**.15**	**.16**	**-.24**	**-.31**	**.21**
Overall Leadership Potential	**.13**	**.18**	**.09**	**.08**	**.13**	**.14**	**-.20**	**-.25**	**.22**

Note. AFFCOM = Affective Commitment; MOS SAT = MOS Satisfaction; CAR INT = Army Career Intentions; RENL INT = Army Reenlistment Intentions; ATT COG = Attrition Cognitions; DIS INC = Disciplinary Incidents (#); DIS INC Y/N = Disciplinary Incidents (Y/N); APFT = APFT Score. Ratings on PRS range from 1 and 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Army-wide PRS, n = 4,913-5,419. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Ratings composite comprises two or more Army-wide PRS.

Table B.7. Correlations between the Job Knowledge Tests (JKTs) and Performance Rating Scales (PRS) in the IMT Validation Sample

Domain/PRS	All MOS Combined [a]	11B/C/X + 18X	12B	13F	19D	19K	31B	42A	68W	88M	WTBD
Army-Wide											
Adjustment to the Army	**.07**	.02	**.23**	-.01	**.16**	**.20**	**.07**	**.20**	-.01	**.11**	**.04**
Effort & Discipline	**.08**	.02	**.20**	.02	**.17**	**.22**	.01	**.26**	.02	**.10**	**.05**
MOS Qualification Knowledge	**.07**	.04	**.23**	.12	**.17**	**.16**	**.06**	**.24**	.00	.04	**.05**
Physical Fitness & Bearing	**.05**	.03	**.25**	.03	**.08**	**.11**	.04	.08	-.02	.03	**.03**
Working with Others	**.07**	.01	.18	.03	**.16**	**.17**	.01	**.21**	-.01	.05	**.02**
Overall Performance	**.08**	**.06**	**.22**	.00	**.15**	**.16**	**.11**	**.21**	.01	**.13**	**.07**
MOS-Specific											
All MOS Combined [b]	**.08**	.03	--	.13	.08	**.16**	.00	**.20**	.00	**.10**	.02
11B/C/X + 18X	**.07**	.03									**.09**
12B	--		--								**.18**
13F	.13			.13							--
19D	.08				.08						--
19K	**.15**					**.16**					**.19**
31B	**.07**						-.01				.04
42A	**.20**							**.20**			**.18**
68W	.04								.00		.03
88M	**.11**									**.10**	**.09**

Note. WTBD = Warrior Tasks and Battle Drills. Army-wide PRS: All MOS Combined, *n* = 7,854-8,347; 11B, *n* = 2,001-2,005; 12B, *n* = 114-115; 13F, *n* = 112-114 ;19D, *n* = 290-303; 19K, *n* = 415-421; 31B, *n* = 1,587-1,594; 42A, *n* = 379; 68W, *n* = 1,855-2,334; 88M, *n* = 980-993; 91B, *n* = 51-58; WTBD, *n* = 10,154-10,738. Ratings on IMT PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. MOS-specific PRS: All MOS Combined, *n* = 103-6,106; 11B, *n* = 1,675; 13F, *n* = 103; 19D, *n* = 285; 19K, *n* = 361; 31B, *n* = 1,387; 42A, *n* = 348; 68W, *n* = 884; 88M, *n* = 911; WTBD, *n* = 105-7,042. Results for MOS with fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

[b] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table B.8. Correlations between the Performance Rating Scales (PRS) and WTBD JKT in the In-Unit Validation Sample

PRS	WTBD JKT
Can Do [a]	**.12**
Effort & Discipline [a]	**.13**
Physical Fitness & Bearing	**.07**
Self-Management [a]	**.11**
Working with Others [a]	**.12**
Adjustment to Army Life	**.12**
Overall Leadership Potential	**.11**

Note. WTBD = Warrior Tasks and Battle Drills. WTBD, n = 4,329-4,633. Ratings on PRS range from 1 and 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results based on fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Ratings composite comprises two or more Army-wide PRS.

Table B.9. Correlations between the Job Knowledge Tests (JKTs) and Administrative Criteria in the IMT Validation Sample

	IMT JKT												
Domain/Measure	All MOS Combined [a]	11B/C/X + 18X	12B	13D	13F	19D	19K	31B	42A	68W	88M	91B	WTBD
Attrition [b]													
6-Month Cumulative	.00	-.01	--			--	-.02	**.06**	.00	.00	.06		-.01
12-Month Cumulative	-.02	-.02	--			--	-.04	.00	.01	.00	-.05	-.06	**-.04**
24-Month Cumulative	**-.07**	**-.08**				--	**-.08**	**-.08**	-.05	-.03	-.05	**-.10**	**-.08**
36-Month Cumulative	**-.06**	**-.09**					.02	**-.08**	-.04	-.02	-.03	-.07	**-.08**
Restarted Initial Military Training (IMT)													
IMT Restarts	.00	**-.03**	.02	.00	-.01	**.10**	-.02	-.01	.01	**.05**	-.02	.01	**-.01**
Training Failures	.01	**.03**	--	-.05	.01	--	.05	.00	.00	**-.04**	.02	.00	**.02**
For Pejorative Reasons	.01	**.03**	--	-.05	.01	--	.05	.00	.00	.01	.01	-.01	**.03**
For Academic Reasons	.01	**.03**	--	-.05	-.01	--	.05	.00	.01	**-.04**	.02	-.01	**.02**

Note. WTBD = Warrior Tasks and Battle Drills. Attrition: All MOS Combined, n = 9658-13970; 11B, n = 4,756-6,738; 13F, n = 117-269; 19K, n = 439-1027; 31B, n = 1,256-1,587; 42A, n = 363-558; 68W, n = 2,002-2,213; 88M, n = 598-995; 91B, n = 215-428; WTBD, n = 12,000-18,344. Training Restarts: All MOS Combined, n = 19,452-28,368; 11B, n = 6,956-10,164; 12B, n = 514; 13F, n = 364-515; 19D, n = 694; 19K, n = 803-1,321; 31B, n = 3,484-5,120; 42A, n = 940-1,173; 68W, n = 2,599-3,647; 88M, n = 3,492-4,198; 91B, n = 611-720; WTBD, n = 25,339-36,951. For Training Restarts, IMT Restarts coded 1 = Restarted at Least Once, 0 = No Restarts; IMT Failures variables coded as 1 = No Failure, 0 = Failed at Least Once. Results based on fewer than 100 cases are not reported. Correlations in bold are statistically significant (p < .05, two-tailed). Blank cells indicate correlations that could not be computed due to no variance in attrition at point in time.

[a] Includes 11B/C/X + 18X, 12B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

[b] Attrition results include Regular Army Soldiers only.

Table B.10. Correlations between the Army Life Questionnaire (ALQ) and Administrative Criteria in the IMT Validation Sample

	IMT ALQ Scale											
Domain/Measure	AFF COM	Army Fit	MOS Fit	NORM COM	CAR INT	RENL INT	ATT COG	AL ADJ	DIS INC #	APFT	TRN ACH	TRN FAIL
Attrition [a]												
6-Month Cumulative	**-.04**	**-.06**	**-.05**	**-.06**	**-.03**	**-.03**	**.12**	**-.07**	**.07**	**-.06**	**-.02**	**.02**
12-Month Cumulative	**-.05**	**-.07**	**-.05**	**-.07**	**-.05**	**-.05**	**.13**	**-.09**	**.07**	**-.06**	**-.02**	**.02**
24-Month Cumulative	**-.04**	**-.06**	**-.05**	**-.06**	**-.03**	**-.05**	**.11**	**-.09**	**.06**	**-.08**	-.01	.01
36-Month Cumulative	**-.04**	**-.07**	**-.06**	**-.06**	**-.03**	**-.05**	**.10**	**-.09**	**.06**	**-.12**	**-.02**	.01
Restarted Initial Military Training (IMT)												
IMT Restarts	**-.01**	**-.01**	**-.03**	.00	.01	.00	**.02**	**-.02**	**.06**	**-.03**	**.02**	**.30**
Training Failures	**.03**	**.04**	**.06**	**.03**	.01	.01	**-.06**	**.06**	**-.10**	**.06**	.00	**-.34**
For Pejorative Reasons	**.03**	**.04**	**.07**	**.04**	.00	.01	**-.07**	**.07**	**-.11**	**.06**	**.03**	**-.37**
For Academic Reasons	**.02**	**.03**	**.05**	**.01**	.00	.01	**-.04**	**.04**	**-.09**	**.05**	.00	**-.35**

Note. AFF COM = Affective Commitment; NORM COM = Normative Commitment; CAR INT = Army Career Intentions; RENL INT = Army Reenlistment Intentions; ATT COG = Attrition Cognitions; AL ADJ = Army Life Adjustment; DIS INC # = Disciplinary Incidents (#); DIS INC Y/N = Disciplinary Incidents (Y/N); APFT = APFT Score; TRN ACH = Training Achievements (# of); TRN FAIL= Training Failure (# of). Attrition: n = 11,863-19,613. Training Restarts: n = 25,763-40,233. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Attrition results include Regular Army Soldiers only.

Table B.11. Correlations between the Performance Rating Scales (PRS) and Attrition in the IMT Validation Sample

	Attrition [a]			
Domain/PRS	6- Month	12-Month	24-Month	36-Month
Army-Wide				
Adjustment to the Army	**-.06**	**-.06**	**-.07**	**-.07**
Effort & Discipline	**-.06**	**-.06**	**-.06**	**-.06**
MOS Qualification Knowledge & Skill	**-.05**	**-.04**	**-.06**	**-.06**
Physical Fitness & Bearing	**-.06**	**-.07**	**-.08**	**-.08**
Working with Others	**-.04**	**-.05**	**-.05**	**-.06**
Overall Performance	**-.07**	**-.08**	**-.09**	**-.09**
MOS-Specific				
All MOS Combined [b]	.00	-.01	**-.04**	**-.04**
11B/C/X and 18X	.00	-.01	-.04	**-.06**
19K		-.06	-.01	-.04
31B	-.05	-.05	**-.13**	**-.09**
42A			.01	.00
68W	.01	.06	-.02	.00
88M	.10	--	--	--

Note. Sample is limited to Army-wide PRS: n = 3,906-5,814. MOS-specific PRS: All MOS Combined, n = 2,756-3,517; 11B, n = 1,295-1,514; 19K, n = 183-339; 31B, n = 493-538; 42A, n = 128-194; 68W, n = 564-581; 88M, n = 224. Ratings on IMT PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results for MOS with fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed). Blank cells indicate correlations that could not be computed due to no variance in attrition at point in time.

[a] Attrition results include Regular Army Soldiers only.

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table B.12. Correlations between the Performance Rating Scales (PRS) and Administrative Criteria in the IMT Validation Sample

	Training Restarts			
Domain/PRS	IMT Recycle	IMT Restart	PEJ Restart	ACAD Failures
Army-Wide				
Adjustment to the Army	-.01	**.05**	**.06**	**.04**
Effort & Discipline	.00	.02	**.03**	.01
MOS Qualification Knowledge & Skill	.00	**.03**	**.03**	**.02**
Physical Fitness & Bearing	.01	**.03**	**.04**	.01
Working with Others	.01	.00	.01	.00
Overall Performance	-.01	**.06**	**.07**	**.05**
MOS-Specific				
All MOS Combined [a]	.03	-.02	-.02	-.02
11B/C/X + 18X	.00	.00	.00	.00
12B	.00	--	--	--
13F	-.07	.10	.10	.10
19K	-.07	**.12**	**.12**	**.12**
31B	-.01	.01	.02	.00
42A	-.10	**.22**	**.20**	**.22**
68W	.04	-.03	-.03	-.03
88M	-.04	**.02**	**.03**	**.02**

Note. IMT Recycle = Recycled at Least Once During IMT; IMT Restart = Restarted at Least Once During IMT; PEJ Restart = Restarted at Least Once for Academic or Other Pejorative Reason; ACAD Restart = Restarted at Least Once for Academic Reasons . Army-wide PRS, *n* = 7,553-11,824. MOS-specific PRS: All MOS Combined, *n* = 5150-7783; 11B, *n* = 1671-2132; 12B, *n* = 324; 13F, *n* = 110-125; 19K, *n* = 298-419; 31B, *n* = 976-1,599; 42A, *n* = 284-389; 68W, *n* = 690-1,035; 88M, *n* = 1,008-1,338. Ratings on IMT PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results for MOS with fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table B.13. Correlations among the Criterion Composites in the IMT and In-Unit (IU) Validation Samples

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. IMT: Overall Performance													
2. IMT: Physical Fitness	**.20**												
3. IMT: Commitment & Fit	**.07**	**.07**											
4. IMT: Retention Cognitions	.02	-.01	**.35**										
5. IMT: Knowledge & Skill	**.09**	**.05**	**.18**	**-.05**									
6. IMT: Disciplinary Incidents (Y/N)	**-.14**	**-.17**	**-.08**	**-.03**	**-.03**								
7. IU: Overall Performance	.12	**.15**	-.02	-.04	.09	**-.10**							
8. IU: Physical Fitness	.11	**.59**	**.06**	-.06	.03	**-.14**	**.22**						
9. IU: Commitment & Fit	.08	.04	**.39**	**.20**	.03	-.04	**.14**	**.07**					
10. IU: Retention Cognitions	.07	-.01	**.13**	**.44**	-.06	.04	**.05**	**.03**	**.42**				
11. IU: Knowledge & Skill	-.04	.01	**.13**	.00	**.49**	-.01	**.14**	.01	**.10**	**-.04**			
12. IU: Disciplinary Incidents (Y/N)	.00	**-.10**	-.02	.04	**-.10**	**.19**	**-.24**	**-.08**	**-.16**	**-.07**	**-.07**		
13. Can Do Performance	**.08**	**.04**	**.19**	**-.05**	**1.00**[a]	**-.03**	**.10**	.01	.03	-.06	**.47**	**-.08**	
14. Will Do Performance	**.50**	**.61**	**.38**	**.24**	**.10**	**-.50**	**.19**	**.38**	**.27**	**.29**	-.16	-.13	**.10**

Note. n = 105-41,151. Results based on fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .05$, two-tailed).
[a] 99% of the Soldiers' scores on these two composites are based on the same subscores, resulting in a very high correlation (r=.999).

Table B.14. Group Differences on IMT and In-Unit Technical Performance, Motivation-Based Performance, and Attrition by Gender

	Male		Female		
Measure	*M*	*SD*	*M*	*SD*	*d*
IMT					
Knowledge & Skill	.03	.87	-.06	.78	**-.10**
WTBD JKT	.63	.13	.62	.12	-.03
Can Do Performance	-.04	1.62	-.18	1.45	**-.09**
Army Fit	4.08	.60	4.13	.58	**.07**
Army Life Adjustment	4.09	.67	4.02	.67	**-.10**
Commitment & Fit	3.97	.58	3.97	.54	.00
Retention Cognitions	2.73	.58	2.83	.56	**.16**
APFT	252.31	27.86	253.51	28.43	**.04**
Will Do Performance	.16	3.05	-.19	3.19	**-.12**
PRS: Effort and Discipline	3.33	.96	3.47	.98	**.14**
PRS: Adjustment to the Army	3.46	.94	3.54	.95	**.08**
PRS: Physical Fitness & Bearing	3.36	.93	3.36	.99	.00
PRS: Working with Others	3.36	.95	3.48	.95	**.12**
PRS: Overall Performance	3.52	.85	3.61	.86	**.11**
IMT Restarts	.05	.22	.06	.24	**.05**
Disciplinary Incidents (Y/N)	.23	.42	.27	.45	**.10**
In-Unit					
Knowledge & Skill	-.05	.95	-.24	.98	**-.20**
WTBD JKT	.63	.11	.60	.11	**-.21**
Army Fit	3.84	.73	3.82	.70	-.03
MOS Fit	3.24	.93	3.06	.97	**-.19**
Commitment & Fit	3.53	.69	3.46	.65	-.10
Retention Cognition	2.39	.67	2.55	.62	**.23**
APFT	254.21	27.86	251.03	28.26	**-.11**
PRS: Effort and Discipline	5.18	1.35	5.12	1.38	-.04
PRS: Working with Others	5.27	1.22	5.36	1.20	.07
PRS: Fitness and Bearing	5.30	1.53	5.05	1.59	**-.17**
PRS: Leadership Potential	4.72	1.68	4.73	1.64	.00
PRS: Overall Performance	5.19	1.14	5.13	1.16	-.05
Disciplinary Incidents (Y/N)	.26	.44	.27	.44	.02
Attrition					
6-Month	.07	.25	.09	.29	**.11**
12-Month	.08	.27	.11	.32	**.13**
24-Month	.11	.31	.14	.35	**.11**
36-Month	.13	.33	.15	.36	**.07**

Note. Females are the referent group. Sample size for Females range from 658 to 86,754; for Males 4,654 to 371,597. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

Table B.15. Group Differences on IMT and In-Unit Technical Performance, Motivation-Based Performance, and Attrition by Race and Ethnicity

	White, Non-Hispanic		Black			Hispanic			Asian		
Measure	*M*	*SD*	*M*	*SD*	*d*	*M*	*SD*	*d*	*M*	*SD*	*d*
IMT											
Knowledge & Skill	.15	.83	-.41	.87	**-.67**	-.20	.83	**-.41**	-.06	.80	**-.25**
WTBD JKT	.64	.12	.57	.13	**-.59**	.60	.12	**-.33**	.61	.12	**-.27**
Can Do Performance	.18	1.58	-.79	1.58	**-.61**	-.42	1.53	**-.38**	-.25	1.49	**-.27**
Army Fit	4.08	.59	4.07	.61	-.02	4.15	.59	**.12**	4.01	.61	**-.13**
Army Life Adjustment	4.09	.66	4.06	.70	**-.05**	4.09	.67	.00	3.95	.72	**-.22**
Commitment & Fit	3.99	.58	3.89	.59	**-.18**	3.99	.56	**-.01**	3.87	.57	**-.22**
Retention Cognitions	2.71	.58	2.85	.57	**.24**	2.79	.57	**.13**	2.75	.53	**.07**
APFT	251.74	28.16	252.80	27.11	**.04**	254.16	27.89	**.09**	254.59	27.16	**.10**
Will Do Performance	.19	3.03	-.34	3.27	**-.17**	.18	3.07	.00	-.18	2.88	-.12
PRS: Effort and Discipline	3.36	.96	3.33	.97	-.03	3.35	.97	.00	3.44	.90	.08
PRS: Adjustment to the Army	3.47	.94	3.44	.95	-.03	3.50	.93	.02	3.53	.89	.06
PRS: Physical Fitness & Bearing	3.34	.94	3.42	.93	**.09**	3.41	.93	**.08**	3.46	.89	**.14**
PRS: Working with Others	3.39	.95	3.37	.97	-.02	3.38	.96	-.01	3.44	.89	.05
PRS: Overall Performance	3.55	.86	3.45	.89	**-.12**	3.51	.84	-.04	3.58	.81	.04
IMT Restarts	.05	.21	.07	.25	**.08**	.05	.22	.01	.05	.21	.00
Disciplinary Incidents (Y/N)	.22	.41	.32	.47	**.23**	.23	.42	.02	.22	.42	.00
In-Unit											
Knowledge & Skill	.14	.89	-.51	1.03	**-.69**	-.24	.91	**-.43**	-.29	.90	**-.48**
WTBD JKT	.65	.10	.58	.11	**-.69**	.61	.10	**-.40**	.60	.10	**-.47**
Army Fit	3.83	.73	3.78	.73	-.06	3.92	.71	**.13**	3.86	.68	.04
MOS Fit	3.28	.93	3.06	.94	**-.23**	3.25	.90	-.02	3.03	.89	**-.26**
Commitment & Fit	3.54	.70	3.44	.67	**-.14**	3.58	.67	.05	3.50	.62	-.06
Retention Cognition	2.34	.67	2.57	.63	**.34**	2.45	.68	**.16**	2.40	.64	.09
APFT	252.62	28.29	254.51	27.24	**.07**	256.76	27.56	**.15**	253.78	27.77	.04
PRS: Effort and Discipline	5.21	1.36	4.95	1.45	**-.19**	5.26	1.28	.04	5.25	1.26	.03
PRS: Working with Others	5.31	1.20	5.15	1.27	**-.13**	5.28	1.22	-.03	5.25	1.22	-.05
PRS: Fitness and Bearing	5.22	1.55	5.25	1.55	.02	5.38	1.51	**.11**	5.35	1.52	.09
PRS: Leadership Potential	4.72	1.69	4.64	1.70	-.04	4.77	1.63	.04	4.65	1.64	-.04
PRS: Overall Performance	5.19	1.15	5.05	1.19	**-.12**	5.25	1.10	.05	5.21	1.12	.02
Disciplinary Incidents (Y/N)	.25	.43	.33	.47	**.18**	.22	.42	**-.07**	.18	.39	**-.16**

Table B.15. (Continued)

	White, Non-Hispanic		Black			Hispanic			Asian		
Measure	*M*	*SD*	*M*	*SD*	*d*	*M*	*SD*	*d*	*M*	*SD*	*d*
Attrition											
6-Month	.08	.27	.06	.24	**-.06**	.05	.23	**-.10**	.04	.20	**-.15**
12-Month	.10	.29	.08	.27	**-.06**	.06	.25	**-.11**	.05	.22	**-.15**
24-Month	.12	.33	.11	.31	**-.05**	.09	.28	**-.12**	.07	.26	**-.16**
36-Month	.14	.35	.12	.33	**-.05**	.10	.30	**-.12**	.08	.27	**-.18**

Note. The Minority group is the referent group. Sample size for Whites, Non-Hispanic range from 2,927 to 269,873; Blacks from 1036 to 101,165; Hispanics from 913 to 73,521; Asians from 197 to 21,155. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

Table B.16. Group Differences on IMT and In-Unit Technical Performance, Motivation-Based Performance, and Attrition by Education Tier

	Tier 1		Tier 2		
Measure	*M*	*SD*	*M*	*SD*	*d*
IMT					
Knowledge & Skill	.01	.86	.03	.89	-.02
WTBD JKT	.62	.12	.63	.12	-.01
Can Do Performance	-.07	1.61	-.04	1.63	-.02
Army Fit	4.09	.60	4.16	.62	**-.12**
Army Life Adjustment	4.08	.67	4.13	.66	**-.07**
Commitment & Fit	3.97	.58	4.06	.59	**-.16**
Retention Cognitions	2.74	.58	2.87	.58	**-.22**
APFT	252.65	27.92	245.24	27.62	**.27**
Will Do Performance	.12	3.06	-.43	3.17	**.18**
PRS: Effort and Discipline	3.35	.96	3.24	.96	**.12**
PRS: Adjustment to the Army	3.48	.94	3.35	.97	**.13**
PRS: Physical Fitness & Bearing	3.37	.94	3.23	.91	**.15**
PRS: Working with Others	3.38	.95	3.32	.97	.06
PRS: Overall Performance	3.54	.85	3.37	.94	**.20**
IMT Restarts	.05	.22	.06	.24	**-.05**
Disciplinary Incidents (Y/N)	.24	.43	.25	.44	-.04
In-Unit					
Knowledge & Skill	-.09	.96	.02	.97	-.12
WTBD JKT	.62	.11	.63	.10	-.09
Army Fit	3.83	.72	3.90	.79	-.10
MOS Fit	3.21	.93	3.24	.98	-.03
Commitment & Fit	3.52	.68	3.59	.77	-.10
Retention Cognition	2.41	.67	2.52	.67	**-.16**
APFT	253.89	27.97	252.26	25.85	.06
PRS: Effort and Discipline	5.16	1.36	5.17	1.36	-.01
PRS: Working with Others	5.27	1.23	5.22	1.21	.04
PRS: Fitness and Bearing	5.27	1.54	5.12	1.62	.09
PRS: Leadership Potential	4.71	1.68	4.76	1.56	-.03
PRS: Overall Performance	5.17	1.15	5.15	1.17	.02
Disciplinary Incidents (Y/N)	.26	.44	.32	.47	-.14
Attrition					
6-Month	.07	.25	.10	.30	**-.12**
12-Month	.08	.28	.12	.32	**-.13**
24-Month	.11	.31	.13	.34	**-.07**
36-Month	.13	.34	.15	.36	**-.06**

Note. Tier 2 is the referent group. Sample size for Tier 1 Soldiers range from 5,360 to 459,268; for Tier 2 Soldiers 158 to 18,281. Significant Cohen's *d* values, based on an independent sample *t*-test between the group means, are in bold ($p < .05$, two-tailed).

APPENDIX C

CRITERION PSYCHOMETRIC PROPERTIES IN THE FULL IMT AND IN-UNIT SAMPLES

Table C.1. Descriptive Statistics for the Job Knowledge Tests (JKTs) in the Full IMT and In-Unit Samples

Domain/Setting/JKT	*n*	*M*	*SD*	*Min*	*Max*	r_{WTBD}
			IMT			
MOS-Specific						
11B/C/X + 18X	20,741	60.43	10.60	20.93	88.37	.59
12B	635	57.15	16.43	8.57	97.14	.59
13D	339	54.36	16.29	8.82	85.29	.58
13F	662	65.80	16.13	17.65	97.06	.54
19D	784	47.33	13.31	13.79	77.59	.58
19K	1,737	66.56	13.00	23.73	96.61	.54
31B	9,687	66.59	9.24	31.58	93.20	.54
42A	1,517	55.62	12.59	15.09	86.79	.54
68W	9,819	73.48	10.26	25.00	96.74	.50
88M	8,029	63.37	10.29	25.71	94.44	.55
91B	1,714	58.12	12.74	23.71	90.72	.45
All MOS Combined [a]	55,664	64.02	12.06	8.57	97.14	.52
WTBD (Army-Wide)	71,449	63.49	12.48	6.45	100.00	
			In-Unit			
WTBD (Army-Wide)	11,968	63.26	11.08	15.38	100.00	

Note. M, SD, Min, and Max are based on percent correct. WTBD = Warrior Tasks and Battle Drills. r_{WTBD} = correlation with WTBD JKT scores. Results for MOS with fewer than 100 cases are not reported. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table C.2. Descriptive Statistics Estimates for the Performance Rating Scales (PRS) in the Full IMT and In-Unit Samples

Domain/Setting/PRS	*n*	*M*	*SD*	*Min*	*Max*
IMT					
Army-Wide					
Adjustment to the Army	23,982	3.34	0.99	1.00	5.00
Effort & Discipline	24,000	3.19	0.99	1.00	5.00
MOS Qualification Knowledge	22,125	3.31	0.94	1.00	5.00
Physical Fitness & Bearing	23,806	3.22	0.99	1.00	5.00
Working with Others	23,902	3.19	0.99	1.00	5.00
Overall Performance	23,727	3.52	0.86	1.00	5.00
MOS-Specific					
11B/C/X + 18X	5,728	3.07	0.82	1.00	5.00
12B	359	2.99	0.56	1.17	5.00
13F	171	3.50	0.66	1.00	5.00
19D	315	2.95	0.58	1.13	4.75
19K	594	3.34	0.69	1.00	5.00
31B	3,151	3.25	0.75	1.00	5.00
42A	496	3.71	0.68	1.80	5.00
68W	3,769	2.79	0.81	1.00	5.00
88M	2,060	3.48	0.79	1.20	5.00
91B	286	2.98	1.13	1.00	5.00
All MOS Combined [a]	16,999	3.12	0.83	1.00	5.00
In-Unit					
Army-Wide					
Can Do [b]	9,656	4.92	1.27	1.00	7.00
Effort & Discipline [b]	9,646	5.18	1.36	1.00	7.00
Physical Fitness & Bearing	9,695	5.25	1.56	1.00	7.00
Self-Management [b]	9,614	5.30	1.14	1.00	7.00
Working with Others [b]	9,652	5.30	1.22	1.00	7.00
Adjustment to Army Life	9,604	5.27	1.53	1.00	7.00
Overall Leadership Potential	9,530	4.73	1.67	1.00	7.00

Note. Ratings on IMT PRS range from 1 to 5. Ratings on IU PRS range from 1 to 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results for MOS with fewer than 100 cases are not reported.

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

[b] Ratings composite comprises two or more Army-wide PRS.

Table C.3. Descriptive Statistics Estimates for the Army Life Questionnaire (ALQ) in the Full IMT and In-Unit Samples

Setting/Scale	*n*	*M*	*SD*	*Min*	*Max*
		IMT			
Affective Commitment	76,573	3.90	0.68	1.00	5.00
Army Fit	76,573	4.08	0.60	1.00	5.00
MOS Fit	76,573	3.75	0.84	1.00	5.00
Normative Commitment	76,573	4.17	0.70	1.00	5.00
Army Career Intentions	76,573	3.21	1.10	1.00	5.00
Army Reenlistment Intentions	76,573	3.50	0.95	1.00	5.00
Attrition Cognition	76,573	1.52	0.60	1.00	5.00
Army Life Adjustment	76,573	4.08	0.67	1.00	5.00
Disciplinary Incidents (#)	64,314	0.30	0.64	0.00	7.00
APFT Score	73,978	252.25	28.45	180.00	300.00
Training Achievement (#)	76,433	0.39	0.59	0.00	2.00
Training Restarts (#) [a]	75,417	0.08	0.30	0.00	2.00
		In-Unit			
Affective Commitment	12,164	3.52	0.82	1.00	5.00
Army Fit	12,164	3.83	0.73	1.00	5.00
MOS Fit	12,164	3.21	0.94	1.00	5.00
MOS Satisfaction	12,164	3.44	0.93	1.00	5.00
Army Career Intentions	12,164	2.56	1.21	1.00	5.00
Army Reenlistment Intentions	12,164	2.96	1.18	1.00	5.00
Attrition Cognition	12,164	1.76	0.77	1.00	5.00
Disciplinary Incidents (#)	12,161	0.46	0.94	0.00	7.00
APFT Score	11,625	252.78	28.39	180.00	300.00

[a] Training Restarts (#) is based on the total number of affirmative responses to whether a Soldier Restarted from BCT or OSUT or whether a Soldier repeated a block or module at AIT or OSUT.

Table C.4. Correlations among the Performance Rating Scales (PRS) in the Full IMT Sample

Domain/PRS		1	2	3	4	5	6
	Army-Wide						
1.	Adjustment to the Army						
2.	Effort & Discipline	.74					
3.	MOS Qualification Knowledge	.71	.67				
4.	Physical Fitness & Bearing	.67	.68	.61			
5.	Working with Others	.72	.75	.68	.64		
6.	Overall Performance	.61	.60	.59	.55	.56	
	MOS-Specific						
7.	11B/C/X + 18X	.68	.64	.69	.62	.67	.53
8.	12B	.59	.40	.62	.50	.50	.64
9.	13F	.65	.54	.75	.59	.69	.76
10.	19D	.67	.62	.76	.57	.62	.76
11.	19K	.59	.59	.72	.55	.47	.70
12.	31B	.64	.60	.68	.54	.64	.56
13.	42A	.66	.64	.68	.44	.65	.72
14.	68W	.60	.56	.65	.51	.61	.37
15.	88M	.72	.70	.76	.68	.70	.56
16.	91B	.72	.67	.80	.66	.72	.57
17.	All MOS Combined [a]	.66	.63	.70	.59	.66	.52

Note. Army-wide PRS: n = 21,925-24,000. MOS-specific PRS: 11B, n = 5,314-5,320; 12B, n = 349-352; 13F, n = 169; 19D, n = 275-288; 19K, n = 571-572; 31B, n = 2,942-2,965; 42A, n = 491; 68W, n = 2,328-2,865; 88M, n = 1,973-1,997; 91B, n = 257-276; All MOS Combined, n = 14,815-15,347. Ratings on IMT PRS range from 1 and 5. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. Results for MOS with fewer than 100 cases are not reported. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Includes 11B/C/X + 18X, 12B, 13B, 13D, 13F, 19D, 19K, 31B, 42A, 68W, 88M, and 91B.

Table C.5. Correlations among Performance Rating Scales (PRS) in the Full In-Unit Sample

Domain/PRS		1	2	3	4	5	6
1.	Can Do [a]						
2.	Effort & Discipline [a]	.78					
3.	Physical Fitness & Bearing	.55	.59				
4.	Self-Management [a]	.75	.76	.58			
5.	Working with Others [a]	.78	.76	.53	.73		
6.	Adjustment to Army Life	.68	.72	.64	.71	.65	
7.	Overall Leadership Potential	.68	.69	.58	.67	.63	.73

Note. Army-wide PRS, n = 9,409-9,695. Ratings on PRS range from 1 to 7. PRS ratings from supervisors with a familiarity rating of 1 ("I have had little opportunity to observe this Soldier") were excluded from analyses. All correlations are statistically significant ($p < .05$, one-tailed).

[a] Ratings composite comprises two or more Army-wide PRS.

Table C.6. Correlations among Army Life Questionnaire (ALQ) Scales in the Full IMT and In-Unit Samples

Scale	1	2	3	4	5	6	7	8	9	10	11	12
1. Affective Commitment		**.78**	**.40**	**.54**		**.60**	**.54**	**-.57**		**-.16**	**.04**	
2. Army Fit	**.84**		**.44**	**.54**		**.59**	**.56**	**-.65**		**-.21**	**.09**	
3. MOS Fit	**.48**	**.49**		**.56**		**.27**	**.23**	**-.32**		**-.11**	**.02**	
4. MOS Satisfaction						**.38**	**.31**	**-.38**		**-.12**	.01	
5. Normative Commitment	**.69**	**.72**	**.41**									
6. Army Career Intentions	**.55**	**.53**	**.26**		**.42**		**.81**	**-.48**		**-.13**	**.05**	
7. Army Reenlistment Intentions	**.53**	**.53**	**.28**		**.46**	**.85**		**-.45**		**-.11**	**.05**	
8. Attrition Cognition	**-.63**	**-.68**	**-.41**		**-.73**	**-.46**	**-.49**			**.22**	**-.11**	
9. Army Life Adjustment	**.45**	**.60**	**.35**		**.45**	**.35**	**.39**	**-.52**				
10. Disciplinary Incidents (#)	**-.08**	**-.11**	**-.08**		**-.07**	**-.04**	**-.05**	**.11**	**-.17**		**-.07**	
11. APFT Score	**.03**	**.09**	**.07**		**.05**	**.02**	**.04**	**-.10**	**.23**	**-.14**		
12. Training Achievement (#)	**.05**	**.07**	**.05**		.00	**.09**	**.06**	**-.03**	**.12**	**-.08**	**.25**	
13. Training Restarts (#) [a]	**-.03**	**-.04**	**-.04**		**-.03**	**-.01**	**-.02**	**.06**	**-.09**	**.16**	**-.06**	**-.05**

Note. Correlations below the diagonal are based on the Full IMT sample, n = 62,130-76,573. Correlations above the diagonal are based on the Full In-Unit sample, n = 11,623-12,164. Missing values reflect the scales that were not administered in either IMT or In-Unit. Correlations in bold are statistically significant ($p < .05$, two-tailed).

[a] Training Restarts is based on the total number of affirmative responses to whether a Soldier recycled from BCT or OSUT or whether a Soldier repeated a block or module at AIT or OSUT (formerly labeled Training Failure).

APPENDIX D

SUMMARY OF BIVARIATE CORRELATIONS BETWEEN TAPAS SCALES AND SELECTED CRITERIA

Table D.1. Summary of the Bivariate Correlations between AFQT, TAPAS and Selected IMT Criteria for Tier 1 + 2 Soldiers

	Knowledge & Skill	WTBD JKT	Disciplinary Incidents (Y/N)	IMT Restarts	Can Do Performance	Army Fit	Army Life Adjustment	Commitment & Fit
n	*3,143 - 27,339*	*4,291 - 35,634*	*4,556 - 37,132*	*63,253 - 455,906*	*4,300 - 35,829*	*4,560 - 38,861*	*4,560 - 38,861*	*4,560 - 38,861*
AFQT	**.45**	**.42**	**-.03**	.00	**.43**	**-.03**	**.06**	.01
Individual TAPAS Scales								
Achievement	**.04**	**.03**	**-.07**	**-.01**	**.03**	**.12**	**.14**	**.11**
Adjustment	**.08**	**.07**	**-.02**	.00	**.07**	**.02**	**.10**	**.03**
Adventure Seeking [a]	**.07**	**.09**	-.04	-.01	**.07**	.02	**.07**	**.04**
Attention Seeking	.00	.01	**-.02**	.00	.00	**.04**	**.08**	**.04**
Commitment to Serve [a]	**-.05**	**-.05**	**-.03**	**.01**	**-.05**	**.12**	**.10**	**.14**
Cooperation	**-.02**	**-.02**	-.01	.00	**-.02**	**.02**	-.01	**.02**
Courage [a]	**.07**	**.08**	**-.05**	.00	**.07**	**.10**	**.14**	**.10**
Dominance	**.03**	**.04**	**-.05**	**-.01**	**.03**	**.10**	**.13**	**.09**
Even Tempered	**.05**	**.05**	**-.02**	**.01**	**.05**	**.03**	**.04**	**.02**
Intellectual Efficiency	**.16**	**.14**	**-.02**	**.01**	**.15**	**.05**	**.12**	**.04**
Non-Delinquency	-.02	-.01	**-.02**	.00	**-.02**	**.06**	**.02**	**.05**
Optimism	**.03**	**.03**	**-.04**	**-.01**	**.03**	**.06**	**.09**	**.06**
Order	**-.08**	**-.08**	**-.03**	**.01**	**-.08**	**.03**	**.03**	.01
Physical Conditioning	.00	.00	**-.09**	**-.03**	.00	**.04**	**.12**	**.04**
Responsibility [a]	**.08**	**.07**	**-.03**	.00	**.08**	**.08**	**.10**	**.08**
Self-Control	.00	.00	-.02	**.01**	.00	**.05**	**.04**	**.03**
Selflessness	**-.03**	**-.03**	.01	.00	**-.03**	**.06**	.01	**.05**
Situational Awareness [a]	**.03**	**.03**	-.03	.01	**.03**	**.05**	**.07**	**.05**
Sociability	**-.10**	**-.08**	.00	**.00**	**-.10**	**.05**	**.05**	**.04**
Team Orientation [a]	**-.04**	**-.04**	**-.04**	.00	**-.04**	**.04**	.02	**.03**
Tolerance	-.01	-.01	.01	**.02**	**-.02**	**.05**	**.03**	**.03**
TAPAS Composites								
Can-Do	**.22**	**.20**	**-.02**	.00	**.22**	**.02**	**.08**	**.03**
Will-Do	**.03**	**.03**	**-.11**	**-.03**	**.03**	**.12**	**.19**	**.11**
Adaptation	**.09**	**.08**	**-.07**	**-.02**	**.09**	**.01**	**.09**	**.03**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.1. (Continued)

	Retention Cognitions	APFT Score	Will Do Performance	PRS: Effort & Discipline	PRS: Adjustment to the Army	PRS: Physical Fitness and Bearing	PRS: Working with Others	PRS: Overall Performance
n	*4,560 - 38,861*	*4,399 - 37,497*	*507 - 6,015*	*1,182 - 11,201*	*1,183 - 11,203*	*1,180 - 11,103*	*1,173 - 11,149*	*1,059 - 10,596*
AFQT	**-.13**	**.09**	**.05**	**.06**	**.04**	**.03**	**.03**	**.06**
Individual TAPAS Scales								
Achievement	**.06**	**.09**	**.14**	**.05**	**.05**	**.05**	**.05**	**.06**
Adjustment	-.01	.01	.03	**-.04**	-.02	.00	-.02	-.03
Adventure Seeking [a]	-.01	**.09**	.08	.00	-.05	.02	.00	-.01
Attention Seeking	**-.02**	**.09**	**.07**	.00	.00	.03	.01	.02
Commitment to Serve [a]	**.22**	**-.02**	**.08**	-.03	-.03	-.03	-.02	-.04
Cooperation	.01	**-.03**	-.02	-.01	.00	-.01	.00	-.01
Courage [a]	**.04**	**.05**	**.10**	.01	.01	.02	-.01	-.01
Dominance	**.05**	**.11**	**.14**	**.03**	**.05**	**.05**	**.04**	**.06**
Even Tempered	**.01**	**-.04**	.00	.01	-.01	-.01	.01	.00
Intellectual Efficiency	**.02**	**.03**	**.07**	.01	.01	.00	.01	.02
Non-Delinquency	**.02**	**-.05**	.00	.00	-.01	**-.03**	.00	-.01
Optimism	.00	**.03**	**.07**	.02	**.03**	.02	.02	**.03**
Order	**.04**	**.03**	.03	.00	.00	.01	.01	.00
Physical Conditioning	**-.03**	**.26**	**.22**	**.06**	**.06**	**.12**	**.05**	**.08**
Responsibility [a]	.01	.01	.06	.04	.03	.01	.02	.03
Self-Control	**.03**	-.01	.01	.01	.00	-.01	.00	.00
Selflessness	**.05**	.00	.00	.00	.00	-.01	.00	.00
Situational Awareness [a]	**.03**	-.01	.05	.02	-.02	.00	.01	.00
Sociability	**.04**	**.02**	**.04**	-.01	.00	.01	.01	.00
Team Orientation [a]	.02	.01	.03	-.01	-.01	-.01	-.01	-.01
Tolerance	**.05**	-.01	.00	.00	-.01	.00	.00	-.01
TAPAS Composites								
Can-Do	-.01	.00	**.04**	.01	.01	-.01	.00	.01
Will-Do	**.02**	**.24**	**.25**	**.07**	**.08**	**.12**	**.07**	**.10**
Adaptation	**-.05**	**.17**	**.15**	**.05**	**.05**	**.08**	**.04**	**.06**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).
[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.2. Summary of the Bivariate Correlations between AFQT, TAPAS and Selected IMT Criteria for Tier 1 Soldiers

	Knowledge & Skill	WTBD JKT	Disciplinary Incidents (Y/N)	IMT Restarts	Can Do Performance	Army Fit	Army Life Adjustment	Commitment & Fit
n	*3,036 - 26,431*	*4,155 - 34,407*	*4,407 - 35,812*	*61,040 - 438,474*	*4,164 - 34,596*	*4,411 - 37,497*	*4,411 - 37,497*	*4,411 - 37,497*
AFQT	**.45**	**.42**	**-.03**	.00	**.44**	**-.03**	**.06**	.01
Individual TAPAS Scales								
Achievement	**.04**	**.03**	**-.07**	**-.01**	**.04**	**.12**	**.14**	**.11**
Adjustment	**.08**	**.07**	**-.02**	.00	**.07**	**.02**	**.10**	**.03**
Adventure Seeking [a]	**.07**	**.09**	**-.04**	**-.01**	**.07**	.02	**.07**	**.05**
Attention Seeking	.00	.01	**-.02**	.00	.00	**.04**	**.08**	**.04**
Commitment to Serve [a]	**-.05**	**-.05**	**-.03**	**.01**	**-.05**	**.12**	**.10**	**.14**
Cooperation	**-.02**	-.02	-.01	.00	**-.02**	**.02**	-.01	**.02**
Courage [a]	**.07**	**.08**	**-.05**	.00	**.07**	**.10**	**.14**	**.11**
Dominance	**.03**	**.04**	**-.05**	**-.01**	**.03**	**.10**	**.13**	**.09**
Even Tempered	**.05**	**.05**	**-.02**	**.01**	**.05**	**.03**	**.04**	**.02**
Intellectual Efficiency	**.16**	**.14**	**-.03**	**.01**	**.15**	**.05**	**.12**	**.04**
Non-Delinquency	-.01	-.01	**-.02**	.00	**-.02**	**.06**	**.02**	**.05**
Optimism	**.03**	**.03**	**-.04**	**-.01**	**.03**	**.06**	**.09**	**.06**
Order	**-.08**	**-.08**	**-.03**	**.01**	**-.08**	**.03**	**.02**	.00
Physical Conditioning	.00	.01	**-.09**	**-.03**	.00	**.04**	**.13**	**.05**
Responsibility [a]	**.08**	**.07**	**-.03**	-.01	**.08**	**.08**	**.10**	**.08**
Self-Control	.00	.00	-.02	**.01**	.00	**.05**	**.04**	**.03**
Selflessness	**-.03**	**-.03**	.01	.00	**-.03**	**.06**	.01	**.05**
Situational Awareness [a]	**.03**	**.03**	**-.03**	.01	**.03**	**.05**	**.07**	**.05**
Sociability	**-.11**	**-.08**	.00	.00	**-.10**	**.05**	**.05**	**.04**
Team Orientation [a]	**-.04**	**-.04**	**-.03**	.00	**-.04**	**.03**	.01	**.03**
Tolerance	-.01	-.01	.01	**.02**	-.01	**.05**	**.03**	**.03**
TAPAS Composites								
Can-Do	**.23**	**.20**	**-.02**	.00	**.22**	**.02**	**.08**	**.03**
Will-Do	**.03**	**.03**	**-.11**	**-.03**	**.03**	**.12**	**.19**	**.11**
Adaptation	**.09**	**.09**	**-.07**	**-.02**	**.09**	**.02**	**.09**	**.03**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.2. (Continued)

	Retention Cognitions	APFT Score	Will Do Performance	PRS: Effort & Discipline	PRS: Adjustment to the Army	PRS: Physical Fitness and Bearing	PRS: Working with Others	PRS: Overall Performance
n	*4,411 - 37,497*	*4,253 - 36,195*	*490 - 5,820*	*1,144 - 10,808*	*1,145 - 10,811*	*1,142 - 10,716*	*1,135 - 10,762*	*1,023 - 10,222*
AFQT	**-.14**	**.09**	**.05**	**.05**	**.04**	**.03**	**.03**	**.06**
Individual TAPAS Scales								
Achievement	**.06**	**.09**	**.14**	**.05**	**.05**	**.05**	**.05**	**.06**
Adjustment	-.01	.02	.03	**-.04**	-.02	-.01	-.02	-.03
Adventure Seeking [a]	-.01	**.09**	.07	-.02	-.05	.02	-.01	-.02
Attention Seeking	-.01	**.09**	**.08**	-.01	.00	.02	.01	.01
Commitment to Serve [a]	**.21**	-.02	**.08**	-.03	-.03	-.03	-.01	-.03
Cooperation	.01	**-.03**	-.03	-.01	.00	-.01	.00	-.01
Courage [a]	**.04**	**.05**	**.11**	.01	.01	.02	-.01	.00
Dominance	**.05**	**.11**	**.14**	**.03**	**.05**	**.05**	**.04**	**.05**
Even Tempered	.01	**-.04**	.01	.01	-.01	-.01	.01	.00
Intellectual Efficiency	**.02**	**.03**	**.07**	.01	.01	.00	.01	.02
Non-Delinquency	**.02**	**-.05**	.00	.01	.00	**-.03**	.00	-.01
Optimism	.00	**.03**	**.07**	.02	.02	.02	.02	.02
Order	**.04**	**.03**	.03	.00	.00	.01	.01	.00
Physical Conditioning	**-.03**	**.26**	**.23**	**.06**	**.07**	**.12**	**.05**	**.08**
Responsibility [a]	.01	.02	.07	.04	.03	.01	.03	.03
Self-Control	**.03**	-.01	.01	.01	.00	-.01	.00	.00
Selflessness	**.05**	-.01	.00	.00	.00	.00	.00	.00
Situational Awareness [a]	.03	-.01	.06	.02	-.02	.01	.01	.00
Sociability	**.04**	**.02**	**.05**	-.01	-.01	.01	.00	-.01
Team Orientation [a]	.02	.01	.02	-.02	-.02	-.02	-.02	-.03
Tolerance	**.05**	-.01	.00	-.01	-.02	.00	-.01	-.01
TAPAS Composites								
Can-Do	**-.02**	.01	**.04**	.01	.01	-.01	.00	.01
Will-Do	**.02**	**.24**	**.25**	**.07**	**.08**	**.12**	**.07**	**.10**
Adaptation	**-.05**	**.17**	**.15**	**.05**	**.05**	**.09**	**.04**	**.07**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.3. Summary of the Bivariate Correlations between AFQT, TAPAS and Selected IMT Criteria for Tier 2 Soldiers

	Knowledge & Skill	WTBD JKT	Disciplinary Incidents (Y/N)	IMT Restarts	Can Do Performance	Army Fit	Army Life Adjustment	Commitment & Fit
n	*107 - 908*	*136 - 1,227*	*149 - 1,320*	*2,213 - 17,432*	*136 - 1,233*	*149 - 1,364*	*149 - 1,364*	*149 - 1,364*
AFQT	**.41**	**.37**	-.01	.01	**.38**	-.03	.01	.01
Individual TAPAS Scales								
Achievement	-.02	-.01	**-.12**	-.01	-.02	**.08**	**.13**	**.08**
Adjustment	.06	.03	.03	.01	.06	-.03	.06	-.03
Adventure Seeking [a]	.08	.11	.07	.01	.11	-.05	.05	-.03
Attention Seeking	.00	.00	.01	.01	.00	.02	.06	.01
Commitment to Serve [a]	.04	.02	-.05	-.01	.03	**.12**	.11	.07
Cooperation	-.02	-.06	-.02	-.01	-.05	-.02	.00	.00
Courage [a]	.02	.10	.00	-.01	.05	.01	.12	-.01
Dominance	-.01	.00	-.06	.00	.00	**.09**	**.14**	**.07**
Even Tempered	.06	.06	.02	.01	.07	-.01	.03	-.02
Intellectual Efficiency	**.09**	**.09**	.00	.01	**.08**	.03	**.07**	.01
Non-Delinquency	-.03	-.02	-.02	-.01	-.03	**.08**	.06	.05
Optimism	-.01	-.01	-.01	.00	-.02	.04	.07	.05
Order	-.09	-.07	-.08	.00	**-.08**	.05	.06	.04
Physical Conditioning	-.03	-.03	**-.07**	-.01	-.02	.07	**.10**	**.07**
Responsibility [a]	.10	.07	-.08	.00	.07	.11	.10	.06
Self-Control	-.02	.02	-.08	.02	.00	.03	-.01	.01
Selflessness	-.05	-.04	.01	-.01	-.05	.01	-.03	.03
Situational Awareness [a]	.03	.06	.04	.00	.05	.01	.03	.03
Sociability	-.03	-.04	-.02	.01	-.03	**.09**	**.09**	.07
Team Orientation [a]	.01	-.03	-.07	-.01	.00	.12	.11	.07
Tolerance	-.01	-.05	.00	.02	-.04	.05	.03	.03
TAPAS Composites								
Can-Do	**.13**	**.13**	.01	.00	**.12**	-.02	-.01	-.03
Will-Do	-.03	-.02	**-.12**	-.01	-.02	**.11**	**.17**	**.11**
Adaptation	.06	.05	-.01	-.01	.06	.00	.03	.00

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations based on fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.3. (Continued)

	Retention Cognitions	APFT Score	Will Do Performance	PRS: Effort & Discipline	PRS: Adjustment to the Army	PRS: Physical Fitness and Bearing	PRS: Working with Others	PRS: Overall Performance
n	*149 - 1,364*	*146 - 1,302*	*107 - 195*	*104 - 393*	*104 - 392*	*102 - 387*	*102 - 387*	*100 - 374*
AFQT	**-.10**	.04	.13	.12	.09	.06	.13	**.14**
Individual TAPAS Scales								
Achievement	.05	**.12**	.11	.13	.05	.08	.05	.11
Adjustment	.00	.02	.03	.00	.04	**.17**	.03	.02
Adventure Seeking [a]	.00	.20	–	–	–	–	–	–
Attention Seeking	-.04	.06	-.07	**.17**	.13	.10	**.21**	**.17**
Commitment to Serve [a]	**.23**	-.06	–	.02	–.06	.00	–.09	–.04
Cooperation	-.05	-.04	.11	-.03	.01	-.01	.01	-.02
Courage [a]	.08	.08	–	.07	–.02	.11	–.02	.00
Dominance	.07	**.13**	**.19**	.12	.07	.06	.12	.13
Even Tempered	-.01	-.06	-.02	-.01	-.01	-.02	.00	-.04
Intellectual Efficiency	.03	.04	.07	.05	.00	.01	.03	.02
Non-Delinquency	.00	-.06	.00	-.04	-.06	-.07	-.02	-.07
Optimism	-.02	.05	.07	.08	.10	.06	.09	.08
Order	.01	.03	.01	.02	-.01	.01	-.03	.00
Physical Conditioning	.06	**.21**	.16	.03	-.01	.08	.05	.02
Responsibility [a]	.01	-.12	–	.09	.01	.14	–.01	.06
Self-Control	.00	.02	.06	.04	.05	-.02	.02	.04
Selflessness	-.01	.04	.05	-.04	.03	-.05	.01	-.01
Situational Awareness [a]	.06	-.07	–	–	–	–	–	–
Sociability	.05	.01	.00	.07	.04	.07	.06	.06
Team Orientation [a]	-.03	.05	–	.18	.17	.11	.18	–
Tolerance	.04	.02	.13	.04	.08	.02	.05	.05
TAPAS Composites								
Can-Do	-.01	.01	.09	.01	.00	-.01	.01	.00
Will-Do	**.08**	**.23**	**.23**	**.13**	.06	.12	.11	.12
Adaptation	.03	**.13**	.11	-.02	-.02	.02	.02	-.03

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations based on fewer than 100 cases are not reported. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.4. Summary of the Bivariate Correlations between AFQT, TAPAS and Selected In-Unit Criteria for Tier 1 + 2 Soldiers

	Knowledge & Skill	WTBD JKT	Disciplinary Incidents (Y/N)	Army Fit	MOS Fit	Commitment & Fit	Retention Cognitions
n	*1,005 - 6,459*	*1,005 - 6,452*	*1,017 - 6,572*	*1,019 - 6,574*	*1,019 - 6,574*	*1,019 - 6,574*	*1,019 - 6,574*
AFQT	**.45**	**.44**	**-.05**	-.03	.03	-.02	**-.13**
Individual TAPAS Scales							
Achievement	**.04**	**.04**	**-.07**	**.08**	**.04**	**.07**	.02
Adjustment	**.08**	**.09**	-.02	.03	.03	.02	-.03
Adventure Seeking [a]	**.11**	**.12**	.01	-.03	.01	.00	**-.11**
Attention Seeking	.00	.01	.01	.02	-.01	.01	-.03
Commitment to Serve [a]	**-.06**	**-.06**	.00	.04	.03	.05	**.12**
Cooperation	**-.04**	-.03	-.03	.03	-.01	.02	.02
Courage [a]	**.07**	**.07**	-.02	.05	**.06**	.06	-.06
Dominance	.01	.01	-.01	**.04**	-.01	.03	.02
Even Tempered	**.04**	**.05**	**-.06**	**.07**	.02	**.05**	.02
Intellectual Efficiency	**.14**	**.14**	-.02	**.04**	.02	.02	-.01
Non-Delinquency	-.03	-.03	**-.06**	**.07**	.01	**.05**	**.04**
Optimism	.01	.00	**-.05**	**.06**	**.04**	**.06**	.00
Order	**-.12**	**-.11**	-.03	.01	**-.04**	-.01	**.05**
Physical Conditioning	-.01	.00	**-.03**	.01	**.04**	.03	-.03
Responsibility [a]	.04	.05	-.03	**.10**	.02	**.08**	.06
Self-Control	-.01	.00	**-.06**	**.05**	.00	.04	.03
Selflessness	**-.04**	**-.04**	-.01	**.06**	.00	**.05**	**.05**
Situational Awareness [a]	.00	.00	-.04	.01	-.02	.00	.00
Sociability	**-.12**	**-.12**	.01	**.05**	.00	**.05**	**.04**
Team Orientation [a]	**-.08**	**-.07**	.01	.02	.00	.03	-.02
Tolerance	-.03	**-.04**	.00	**.06**	-.01	**.04**	**.07**
TAPAS Composites							
Can-Do	**.24**	**.24**	-.03	.00	.03	.00	**-.06**
Will-Do	.01	.02	**-.06**	**.07**	**.05**	**.07**	.00
Adaptation	**.09**	**.10**	**-.04**	.02	**.05**	**.03**	**-.04**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).
[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.4. (Continued)

	APFT Score	PRS: Effort & Discipline	PRS: Working with Others	PRS: Physical Fitness & Bearing	PRS: Leadership Potential	PRS: Overall Performance
n	*983 - 6,296*	*838 - 5,270*	*838 - 5,272*	*838 - 5,293*	*825 - 5,193*	*837 - 5,263*
AFQT	-.02	**.09**	**.12**	.01	**.07**	**.09**
Individual TAPAS Scales						
Achievement	**.07**	**.06**	**.06**	**.06**	**.08**	**.07**
Adjustment	.01	.02	.00	.00	.01	.01
Adventure Seeking [a]	**.13**	.04	.03	.07	.02	.05
Attention Seeking	**.08**	.01	.00	**.05**	**.05**	.03
Commitment to Serve [a]	.03	.00	.02	.05	.00	.02
Cooperation	-.03	.00	.02	.01	.00	.01
Courage [a]	.06	.01	.03	-.01	.01	.01
Dominance	**.11**	.01	.03	**.04**	**.04**	.03
Even Tempered	**-.04**	.00	.02	-.01	.01	.01
Intellectual Efficiency	.01	.01	**.04**	.01	.01	.02
Non-Delinquency	**-.07**	.01	.01	-.02	.01	.00
Optimism	.02	.02	.03	.03	.03	**.04**
Order	.02	-.01	.00	-.01	.00	.00
Physical Conditioning	**.24**	**.04**	**.04**	**.10**	**.06**	**.06**
Responsibility [a]	.03	.06	**.08**	.04	**.07**	**.07**
Self-Control	.00	.02	.02	.00	.02	.02
Selflessness	-.02	.03	.04	.02	.04	.03
Situational Awareness [a]	.01	.01	.03	.01	.03	.03
Sociability	**.05**	-.02	-.01	.01	.01	-.01
Team Orientation [a]	-.01	-.02	-.03	.01	.00	-.01
Tolerance	.00	-.01	-.01	-.03	-.01	-.02
TAPAS Composites						
Can-Do	-.01	.03	**.05**	.02	.03	.04
Will-Do	**.22**	**.06**	**.07**	**.11**	**.09**	**.09**
Adaptation	**.15**	**.04**	**.05**	**.08**	**.05**	**.06**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).
[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.5. Summary of the Bivariate Correlations between AFQT, TAPAS and Selected In-Unit Criteria for Tier 1 Soldiers

	Knowledge & Skill	WTBD JKT	Disciplinary Incidents (Y/N)	Army Fit	MOS Fit	Commitment & Fit	Retention Cognitions
n	*980 - 6,275*	*980 - 6,268*	*991 - 6,382*	*993 - 6,384*	*993 - 6,384*	*993 - 6,384*	*993 - 6,384*
AFQT	**.45**	**.44**	**-.05**	**-.04**	.03	-.03	**-.13**
Individual TAPAS Scales							
Achievement	**.04**	**.04**	**-.07**	**.08**	**.04**	**.07**	.02
Adjustment	**.09**	**.09**	-.02	.03	.03	.02	-.03
Adventure Seeking [a]	**.11**	**.12**	.01	-.03	.00	-.01	**-.12**
Attention Seeking	.00	.01	.01	.02	-.01	.01	-.03
Commitment to Serve [a]	**-.07**	**-.07**	-.01	.04	.02	.05	**.12**
Cooperation	**-.04**	-.03	-.03	.04	-.01	.02	.02
Courage [a]	**.07**	**.07**	-.03	.05	**.07**	.06	**-.06**
Dominance	.01	.01	-.01	**.05**	-.01	.03	.02
Even Tempered	**.04**	**.05**	**-.06**	**.06**	.02	**.05**	.02
Intellectual Efficiency	**.14**	**.14**	-.03	**.04**	.02	.02	-.01
Non-Delinquency	-.03	-.03	**-.07**	**.07**	.01	**.06**	**.04**
Optimism	.01	.00	**-.05**	**.06**	**.04**	**.06**	.00
Order	**-.12**	**-.11**	-.03	.00	**-.04**	-.01	**.05**
Physical Conditioning	-.01	.00	**-.03**	.01	**.04**	.03	-.03
Responsibility [a]	.04	.05	-.05	**.10**	.02	**.08**	.06
Self-Control	-.01	.00	**-.06**	**.05**	.00	.04	.03
Selflessness	**-.04**	**-.04**	-.01	**.07**	.00	**.06**	**.05**
Situational Awareness [a]	.00	.01	-.05	.01	-.02	.00	.01
Sociability	**-.12**	**-.12**	.01	**.05**	.01	**.05**	**.04**
Team Orientation [a]	**-.08**	**-.07**	.02	.02	.00	.03	-.02
Tolerance	-.03	**-.04**	.00	**.06**	-.01	**.05**	**.07**
TAPAS Composites							
Can-Do	**.24**	**.24**	-.03	.00	.03	.00	**-.07**
Will-Do	.02	.02	**-.07**	**.07**	**.05**	**.07**	.00
Adaptation	**.10**	**.10**	**-.04**	.02	**.05**	.03	**-.04**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).
[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.5. (Continued)

	APFT Score	PRS: Effort & Discipline	PRS: Working with Others	PRS: Physical Fitness & Bearing	PRS: Leadership Potential	PRS: Overall Performance
n	*958 - 6,114*	*816 - 5,122*	*816 - 5,124*	*816 - 5,145*	*803 - 5,046*	*815 - 5,115*
AFQT	-.02	**.09**	**.12**	.02	**.07**	**.09**
Individual TAPAS Scales						
Achievement	**.08**	**.06**	**.06**	**.06**	**.08**	**.07**
Adjustment	.01	.02	.00	.00	.01	.01
Adventure Seeking [a]	**.12**	.05	.03	.08	.02	.05
Attention Seeking	**.08**	.01	.01	**.05**	**.05**	.03
Commitment to Serve [a]	.03	.00	.01	.04	.00	.02
Cooperation	-.03	.00	.02	.00	.00	.01
Courage [a]	**.07**	.02	.03	.00	.02	.01
Dominance	**.11**	.01	.03	**.04**	**.04**	.03
Even Tempered	-.03	.00	.02	-.01	.02	.01
Intellectual Efficiency	.01	.01	**.04**	.01	.01	.02
Non-Delinquency	**-.06**	.01	.02	-.02	.01	.01
Optimism	.03	.02	.03	**.04**	**.04**	**.04**
Order	.02	.00	.00	.00	.00	.00
Physical Conditioning	**.24**	**.04**	**.04**	**.10**	**.06**	**.06**
Responsibility [a]	.04	.06	**.08**	.04	**.08**	**.07**
Self-Control	.00	.01	.01	.00	.01	.02
Selflessness	-.01	.03	.04	.02	.04	.03
Situational Awareness [a]	.01	.01	.04	.01	.04	.03
Sociability	**.05**	-.02	-.02	.01	.01	-.01
Team Orientation [a]	-.01	-.01	-.03	.01	-.01	-.01
Tolerance	.00	.00	.00	-.03	-.01	-.02
TAPAS Composites						
Can-Do	-.01	.03	**.05**	.02	.02	.03
Will-Do	**.22**	**.06**	**.06**	**.11**	**.09**	**.09**
Adaptation	**.15**	**.04**	**.04**	**.08**	**.05**	**.06**

Note. WTBD JKT = Warrior Tasks and Battle Drills Job Knowledge Test. PRS = Performance Rating Scales. Correlations in bold are statistically significant ($p < .01$, two-tailed).
[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.6. Summary of the Bivariate Correlations between AFQT, TAPAS, and Selected Attrition Criteria for Tier 1 + 2 Soldiers (Regular Army Only)

	Attrition		
	6-Mos	12-Mos	24-Mos
n	*33,995 - 216,372*	*33,688 - 191,856*	*31,624 - 151,449*
AFQT	**-.06**	**-.05**	**-.07**
Individual TAPAS Scales			
Achievement	**-.02**	**-.02**	**-.02**
Adjustment	**-.01**	**-.01**	**-.01**
Adventure Seeking [a]	**-.03**	**-.03**	**-.02**
Attention Seeking	**-.03**	**-.03**	**-.01**
Commitment to Serve [a]	**.02**	**.01**	**.02**
Cooperation	**.01**	.01	**.01**
Courage [a]	.00	.00	.01
Dominance	**-.03**	**-.03**	**-.02**
Even Tempered	.00	.00	**-.01**
Intellectual Efficiency	**-.01**	.00	.00
Non-Delinquency	**.02**	**.02**	.01
Optimism	**-.02**	**-.02**	**-.02**
Order	**.01**	**.01**	**.01**
Physical Conditioning	**-.07**	**-.08**	**-.07**
Responsibility [a]	-.01	-.01	-.01
Self-Control	.00	.00	.00
Selflessness	**.02**	**.02**	**.03**
Situational Awareness [a]	.00	.00	.00
Sociability	**.01**	**.01**	**.03**
Team Orientation [a]	**-.02**	**-.03**	**-.04**
Tolerance	**.01**	**.01**	**.01**
TAPAS Composites			
Can-Do	**-.02**	**-.02**	**-.03**
Will-Do	**-.06**	**-.07**	**-.07**
Adaptation	**-.06**	**-.07**	**-.08**

Note. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.7. Summary of the Bivariate Correlations between AFQT, TAPAS, and Selected Attrition Criteria for Tier 1 Soldiers (Regular Army Only)

	Attrition		
	6-Mos	12-Mos	24-Mos
n	*33,124 - 209,283*	*32,834 - 185,576*	*30,882 - 146,843*
AFQT	**-.06**	**-.06**	**-.07**
Individual TAPAS Scales			
Achievement	**-.02**	**-.02**	**-.03**
Adjustment	**-.01**	**-.01**	**-.01**
Adventure Seeking [a]	**-.03**	**-.03**	**-.02**
Attention Seeking	**-.03**	**-.03**	**-.02**
Commitment to Serve [a]	**.02**	**.01**	**.02**
Cooperation	**.01**	.01	**.01**
Courage [a]	.00	.00	.01
Dominance	**-.03**	**-.03**	**-.02**
Even Tempered	.00	.00	**-.01**
Intellectual Efficiency	**-.01**	**-.01**	-.01
Non-Delinquency	**.02**	**.02**	.01
Optimism	**-.02**	**-.02**	**-.02**
Order	**.01**	**.01**	**.01**
Physical Conditioning	**-.07**	**-.08**	**-.08**
Responsibility [a]	-.01	-.01	-.01
Self-Control	.00	.00	-.01
Selflessness	**.02**	**.02**	**.03**
Situational Awareness [a]	.00	.00	-.01
Sociability	**.01**	**.01**	**.03**
Team Orientation [a]	**-.02**	**-.03**	**-.04**
Tolerance	**.01**	**.01**	**.01**
TAPAS Composites			
Can-Do	**-.02**	**-.02**	**-.03**
Will-Do	**-.06**	**-.07**	**-.07**
Adaptation	**-.06**	**-.07**	**-.08**

Note. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

Table D.8. Summary of the Bivariate Correlations between AFQT, TAPAS, and Selected Attrition Criteria for Tier 2 Soldiers (Regular Army Only)

	Attrition		
	6-Mos	12-Mos	24-Mos
n	*862 - 5,400*	*718 - 3,813*	*517 - 3,230*
AFQT	**-.04**	-.02	**-.06**
Individual TAPAS Scales			
Achievement	-.02	-.01	-.02
Adjustment	-.02	.00	.01
Adventure Seeking [a]	-.03	-.04	-.01
Attention Seeking	-.01	.00	.01
Commitment to Serve [a]	.02	.01	.02
Cooperation	.00	.02	.01
Courage [a]	-.02	.00	-.05
Dominance	-.01	-.01	-.01
Even Tempered	.02	.02	.01
Intellectual Efficiency	-.01	.01	-.01
Non-Delinquency	.03	.01	.00
Optimism	-.02	-.01	-.01
Order	.01	.00	.00
Physical Conditioning	**-.04**	-.04	-.03
Responsibility [a]	-.03	.02	-.01
Self-Control	.02	.02	.03
Selflessness	**.04**	.03	.04
Situational Awareness [a]	.05	.01	.08
Sociability	.00	-.01	.02
Team Orientation [a]	-.04	-.04	.00
Tolerance	.01	.01	.02
TAPAS Composites			
Can-Do	.00	.03	-.02
Will-Do	**-.04**	-.03	-.04
Adaptation	-.02	-.02	-.03

Note. Correlations in bold are statistically significant ($p < .01$, two-tailed).

[a] Sample sizes for six TAPAS scales were considerably smaller than the other dimensions because not all scales were administered in every version of the TAPAS.

APPENDIX E

SUMMARY OF LOGISTIC REGRESSION ANALYSES OF THE TAPAS IN PREDICTING FIRST-TERM REENLISTMENT BY MOS

Table E1. Logistic Regression Results for Reenlistment after First Term

	Model Fit				Predictor Statistics			
MOS (*n*)	Model	*df*	-2LL	Δ-2LL	Predictor	*OR*	*OR* 95% LL	*OR* 95% UL
All	Step 1	1	**45324.45**		AFQT	0.843	0.825	0.861
(34,884)	Step 2	10	**45088.33**	**236.12**	AFQT	0.835	0.815	0.855
					Achievement	1.068	1.041	1.094
					Adjustment	0.961	0.939	0.984
					Attention Seeking	0.959	0.937	0.982
					Cooperation	0.966	0.944	0.989
					Dominance	1.070	1.044	1.097
					Intellectual Efficiency	1.041	1.014	1.069
					Order	1.037	1.013	1.061
					Physical Conditioning	0.942	0.920	0.964
					Tolerance	1.090	1.065	1.115
11B/C/X/18X	Step 1	1	**10982.47**		AFQT	0.856	0.819	0.895
(7,971)	Step 2	5	**10932.47**	**50.00**	AFQT	0.844	0.808	0.882
					Achievement	1.085	1.034	1.140
					Cooperation	0.949	0.906	0.993
					Dominance	1.111	1.060	1.165
					Self-Control	0.952	0.909	0.998
12B	Step 1	1	**1285.05**		AFQT	0.762	0.664	0.874
(979)	Step 2	1	**1285.05**	—[a]	AFQT	0.762	0.664	0.874
13B	Step 1	1	1557.32		AFQT[c]	0.876	0.768	1.000
(1,144)	Step 2	2	**1549.67**	—[a]	Achievement	1.137	1.007	1.284
					Cooperation	0.840	0.742	0.950
19D	Step 1	1	**2413.07**		AFQT	0.790	0.725	0.881
(1,760)	Step 2	2	**2401.40**	**11.67**	AFQT	0.793	0.719	0.875
					Achievement	1.181	1.073	1.300
25U	Step 1	1	614.87		AFQT[c]	0.952	0.766	1.185
(511)	Step 2	2	**604.61**	—[a]	Adjustment	0.763	0.624	0.934
					Dominance	1.247	1.026	1.516
31B	Step 1	1	**516.87**		AFQT	0.713	0.561	0.906
(442)	Step 2	1	**516.87**	—[a]	AFQT	0.713	0.561	0.906
42A	Step 1	1	**299.15**		AFQT	0.557	0.404	0.769
(438)	Step 2	3	**289.71**	**9.43**	AFQT	0.602	0.432	0.840
					Even-Tempered	0.721	0.525	0.990
					Self-Control	1.533	1.112	2.114

Table E1. Logistic Regression Results for Reenlistment after First Term (continued)

	Model Fit				Step 2 Predictor Statistics			
MOS (*n*)	Model	*df*	-2LL	Δ-2LL	Predictor	*OR*	*OR* 95% LL	*OR* 95% UL
68W	Step 1	1	2764.43		AFQT[c]	0.956	0.825	1.107
(2,062)	Step 2	2	**2750.35**	—[a]	Achievement	1.135	1.037	1.241
					Tolerance	1.108	1.013	1.212
88M	Step 1	1	**1224.73**		AFQT	0.834	0.711	0.979
(1,056)	Step 2	2	**1224.73**	—[a]	AFQT	0.834	0.711	0.979
91B	Step 1	1	**2146.87**		AFQT	0.767	0.682	0.863
(1,773)	Step 2	3	**2130.65**	**16.22**	AFQT	0.770	0.684	0.867
					Dominance	1.175	1.055	1.308
					Self-Control	1.149	1.034	1.275
92G	Step 1[b]	1	937.30		AFQT[c]	0.865	0.729	1.027
(769)								

Note. -2LL = -2 log likelihood (deviance). *OR* = odds ratio. 95% LL = 95% confidence interval lower limit of the odds ratio. 95% UL = 95% confidence interval upper limit of the odds ratio. The Step 1 model includes the AFQT only. The Step 2 model adds the TAPAS scales to the AFQT-only model. All predictors are significant ($p < .05$) unless otherwise noted. For MOS-specific results, Soldiers were only included if they stayed in the same MOS when they reenlisted. Bolded values indicate either significant model fit (-2LL) or significant change in model fit (Δ-2LL) based on a Likelihood Ratio $\chi 2$ test, $p < .05$.

[a] The change in model fit was not computed because the Step 1 and Step 2 models are either (a) identical or (b) not nested. Models were not nested when the effect of AFQT was not significant in Step 1 and was therefore removed from the final model.

[b] The Step 2 (i.e., combined AFQT and TAPAS) model contained no significant predictors. Therefore, only the Step 1 (i.e., AFQT-only) model results are presented.

[c] The effect of the predictor was not significant.